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The Role of Psychological Flexibility and Negative Self-Schemas in Distressing Auditory Hallucinations: A Systematic Review and Empirical Study

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THESIS ABSTRACT

Cognitive Behavioural Therapy for psychosis aims to alter an individual's beliefs about their voices and is the most widely-used psychological intervention for distressing hallucinations. Meta-analyses have shown modest beneficial effects. Mindfulness and acceptance-based therapies are becoming an increasingly popular approach for individuals with a range of mental health difficulties. A systematic review was conducted to evaluate the evidence base for these therapies in the treatment of distressing auditory hallucinations. Nine studies met the inclusion criteria; four controlled studies and five case studies. Beneficial results were reported in relation to hallucination-related distress, belief conviction, cognitive appraisals, hallucination proneness and the ability to respond mindfully to hallucinations. However, the quality and methodological rigour of these studies were poor and the results are likely to have been subject to considerable bias. As such, mindfulness and acceptance-based therapies cannot yet be considered evidence-based treatments for distressing hallucinations.

The relationship between malevolent and omnipotent appraisals of voices and psychological distress is relatively well-established. It was hypothesised that negative self-schemas mediate the relationship between negative appraisals and voice-related distress. In addition, psychological flexibility was hypothesised to influence the strength of these relationships. Negative self-schemas were found to mediate the relationship between omnipotent appraisals and voice-related distress but not malevolent appraisals and voice-related distress. A high degree of psychological flexibility was found to moderate the association between negative appraisals and voice-related distress. This effect was stronger for appraisals of malevolence. The

results suggest that negative self-schemas and psychological flexibility may be useful targets for psychological therapy for distressing auditory hallucinations. In addition, the results highlight the importance of assessing an individual's beliefs about their hallucinations when considering treatment options.

CHAPTER 1: SYSTEMATIC REVIEW

Mindfulness and Acceptance-Based Therapies in the Treatment of Distressing
Auditory Hallucinations: A Systematic Review¹

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¹ This review has been written in accordance with author guidelines for the Clinical Psychology Review journal (Thesis Appendix A).

Abstract

Objectives. Mindfulness and acceptance-based therapies are becoming increasingly popular in practise and meta-analyses have been conducted to evaluate their effects on a range of mental health difficulties. The purpose of this review was to evaluate the evidence base for mindfulness and acceptance-based therapies in the treatment of distressing auditory hallucinations.

Method. Five electronic databases were searched in addition to an internet search engine. Authors of included studies were contacted and reference lists were reviewed. Quality criteria were developed and studies were rated independently by three raters.

Results. Nine studies met the inclusion criteria; four controlled studies and five case studies. There was substantial variation in study design and outcomes. Overall, the quality of the studies was poor. Reductions in hallucination-related distress, belief conviction, cognitive appraisals and hallucination proneness were noted. Participants' ability to respond mindfully to hallucinations increased.

Conclusion. Although the results of this review suggest that mindfulness and acceptance-based therapies may result in several beneficial effects, the quality of these studies was poor and the results are likely to have been subject to considerable bias. More research is needed before such therapies can be considered evidence-based treatments for distressing hallucinations. Suggestions for future research are made.

Keywords: hallucinations, voices, psychosis, acceptance, mindfulness, compassion, third wave

Highlights

- Nine studies were identified, of which only four were controlled studies.
- Voice-related distress, belief conviction and negative voice appraisals decreased.
- Participants' ability to respond mindfully to hallucinations increased.
- The quality of the included studies was poor and results were subject to bias.
- Suggestions for future research are made.

Mindfulness and Acceptance-Based Therapies in the Treatment of Distressing Auditory Hallucinations: A Systematic Review

Psychological techniques aiming to reduce distress in relation to auditory verbal hallucinations (AVH) are generally embedded within interventions addressing psychosis as a whole. Cognitive Behavioral Therapy for psychosis (CBTp) is currently the most widely used psychological intervention to address positive symptoms. CBT encourages patients first to identify, then challenge the validity of distressing or problematic thoughts within the context of a trusting therapeutic relationship. Wykes et al. (2008) conducted a meta-analysis of 34 studies assessing the effectiveness of CBTp for individuals diagnosed with schizophrenia. The authors found that CBTp resulted in modest beneficial effects on positive symptoms but noted a 60% reduction in effect size in studies which had attempted masked assessment. Fifteen studies in the meta-analysis provided data on functioning and 13 studies assessed mood providing mean weighted effect sizes of Glass' $\Delta = 0.38$ and Glass' $\Delta = 0.36$ respectively. Glass' Δ uses the control group standard deviation in the denominator and can be interpreted using Cohen's (1988) conventions for effect sizes. A recent analysis by Jauhar et al. (2014) found that 30 studies investigating the effects of CBTp on positive symptoms resulted in a small effect size (Hedges' $g = -0.24$). Of the 30 studies reviewed in the meta-analysis, 15 provided specific data relating to hallucinations. A small effect size (Hedges' $g = -0.34$) was observed in relation to reduced symptom severity. However, the meta-analysis failed to examine the effect of CBTp on psychological distress.

Over the past 15 years, additional psychological therapies have been developed which build upon CBT and incorporate mindfulness and acceptance

techniques. Often referred to as ‘third wave’ therapies, they are characterised by a shift away from attempts to modify the content and interpretations of distressing experiences towards a stance of compassion, non-judgemental awareness and commitment to working towards valued goals, even when distressing psychological content is present. They include a wide range of interventions including Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999; 2011), Functional Analytic Psychotherapy (FAP; Kohlenberg & Tsai, 1991), Dialectical Behavior Therapy (DBT; Linehan, 1993), Cognitive Behavioral Analysis System of Psychotherapy (CBASP; McCullough, 2000), Mindfulness-Based Stress Reduction (Kabat-Zinn, 1990) and Mindfulness-Based Cognitive Therapy (Segal, Williams & Teasdale, 2002). Despite the inclusion of different techniques, these therapies are considered to share important commonalities which set them apart from traditional CBT. Hayes (2004) observed that “Their methods are often more experiential than didactic; their underlying philosophies are more contextualistic than mechanistic.” A central theme of mindfulness and acceptance-based interventions is the ability, through mindfulness, to “disidentify from the contents of consciousness (i.e., one’s thoughts) and view his or her moment-by-moment experience with greater clarity and objectivity” (Shapiro et al., 2006).

Öst (2008) conducted a systematic review and meta-analysis of third-wave therapies with a variety of mental health difficulties, including depression, psychosis and borderline personality disorder. Large effect sizes were noted for both ACT (Hedges’ $g = 0.96$) and DBT (Hedges’ $g = 1.30$) in comparison to waiting list, reducing to a moderate effect sizes when compared to treatment as usual (TAU) (Hedges’ $g = 0.79$ and 0.47 respectively) and another active treatment (Hedges’ $g =$

0.53 and 0.47 respectively). A subsequent meta-analysis (Powers et al., 2009) reviewed studies published up to 2008, assessing the effectiveness of ACT for a variety of physical and mental health problems including psychosis, depression, diabetes, substance abuse, pain and maths anxiety. ACT was found to be superior to waiting list (Hedges' $g = 0.68$) and TAU (Hedges' $g = 0.42$). However, ACT was not significantly more effective than established treatments (Hedge's $g = -0.18$). In both reviews, the authors stated that further research was required comparing therapies such as ACT with other established treatments for specific disorders.

Mindfulness and acceptance-based therapies are becoming an increasingly popular approach to living well with psychosis (e.g. Bach & Hayes, 2002; Gaudiano & Herbert, 2006; White et al., 2011; Shawyer et al., 2012). Mindfulness and acceptance-based therapies such as ACT were developed to treat mental health difficulties characterized by experiential avoidance, a process by which a person is unwilling to experience a negatively evaluated private event and thus takes action to reduce or get rid of that private event despite the behavioural costs of doing so. In the case of auditory hallucinations, ACT proposes that an individual should be encouraged to accept the voices without judgement, identifying worthwhile goals and working toward these in spite of the presence of auditory hallucinations (Viega-Martínez et al., 2008).

A recent systematic review and meta-analysis by Khoury et al. (2013) examined 13 studies with a combined sample size of 468 patients with psychotic disorders. Khoury et al. (2013) found that mindfulness-based therapies were moderately effective in improving functioning and quality of life. The aim of mindfulness-based interventions is to reduce distress resulting from difficult

experiences as opposed to a reduction in the symptoms themselves; however a moderate reduction in negative and affective symptoms was also observed. Smaller effects were noted in relation to positive symptoms.

Although frequently co-occurring, it is not uncommon for hallucinations to occur in the absence of delusions and vice versa. Breier and Berg (1999) found that 65% of 1,655 individuals diagnosed with schizophrenia reported delusions and only 52% experienced hallucinations. In addition, there is increasing evidence to support the view that the development and maintenance of psychotic symptoms are underpinned by different environmental experiences and cognitive processes (see Bentall & Fernyhough, 2008). For example, insecure attachment has been shown to be associated with paranoia but not hallucinations (Pickering et al., 2008). It is generally accepted that auditory hallucinations are associated with deficits in source monitoring, leading to the misattribution of thoughts (for review, see Brookwell et al., 2013). Psychotic patients who experience auditory hallucinations exhibit higher levels of dysfunctional metacognitions such as positive beliefs about worry, and negative beliefs about uncontrollability, danger, responsibility and superstition than patients with delusions who do not experience hallucinations (Morrison & Wells, 2003).

Given the heterogeneous nature of individuals experiencing psychotic symptoms, it has been suggested that a diagnostic approach to the understanding and treatment of psychosis is inadequate. The ‘complaint-orientated approach’ to psychopathology advocates a shift in focus from diagnostic labels towards the understanding of individual symptoms and implies that “treatments should be delivered according to patients’ needs” (Bentall, 2006). In line with a complaint-

orientated approach, it is useful to understand whether interventions alter the psychological impact of specific symptoms. It is therefore necessary to examine individual symptoms and related distress as distinct outcomes. To date, no systematic review has been conducted to assess the effect of mindfulness and acceptance-based therapies on the experience and psychological consequences of distressing hallucinations.

Method

Literature Search

An initial literature search was conducted in August 2013 to confirm whether a similar review had been undertaken. This search used the PsycINFO Database as well as the online Cochrane Database of Abstracts of Reviews of Effects (DARE), Cochrane Database of Systematic Reviews, National Institute for Health and Clinical Excellence (NICE) and Scottish Intercollegiate Guidelines Network (SIGN) guidelines and encompassed all ACT systematic reviews and meta-analyses. To ensure that the systematic review would not duplicate any ongoing reviews, PROSPERO databases were searched. No relevant reviews were identified.

Database search. Five electronic databases were searched on 18th January 2014 to include results from 1980 to 2014:

1. EMBASE
2. PsycINFO
3. MEDLINE
4. CINAHL
5. ASSIA

The following search terms were used: (hallucinat* OR voices OR psychosis OR psychotic) AND (acceptance OR commitment OR flexibility OR mindful* OR defusion OR distancing OR metacog* OR “perspective taking”) AND (therapy OR outcome).

Other resources. The reference lists of included studies were searched for additional relevant publications. Authors of included studies were also approached and asked to provide any unpublished data and information regarding ongoing research relevant to the review question. Additionally, three separate searches were conducted via Google Scholar on 31st January 2014 using the following lists of search terms:

hallucinations voices psycho acceptance flexibility mindfulness defusion distancing
metacognitive “perspective taking”

hallucinations psycho acceptance flexibility mindfulness defusion distancing
metacognitive “perspective taking”

hallucinations psychosis psychotic acceptance flexibility mindfulness defusion
distancing metacognitive

Inclusion and Exclusion Criteria

Population. Adults aged 18 years or over who reported experiencing auditory hallucinations, regardless of psychiatric diagnosis.

Intervention. All mindfulness and acceptance-based therapies which encouraged a stance of acceptance and mindful awareness including, but not restricted to, Acceptance and Commitment Therapy, Compassionate Mind Training and mindfulness-based therapies such as Mindfulness-Based Cognitive Therapy and Mindfulness-Based Stress-Reduction. Interventions which included a significant

cognitive modification component e.g. cognitive therapy, metacognitive therapy, were excluded. Relevant interventions provided on an individual or group basis, and in an inpatient or outpatient setting were included.

Comparators. Studies without a comparison group were included.

Outcome measures. Studies were required to include at least one outcome measure specific to the experience of auditory hallucinations such as frequency or severity of hallucinations, voice-related distress and beliefs about voices.

Study design. Studies which directly compared a mindfulness and acceptance-based therapy to another psychological therapy were preferred. However, given the specific nature of the review question, only a small number of controlled studies were available. Therefore, case studies and case series were also included in this review.

Assessment of Quality of Included Studies

Given the variety of study designs, two separate quality checklists were developed to facilitate the assessment of evidence for the purposes of this review: one for controlled studies and another for uncontrolled studies². These checklists were based on the Scottish Intercollegiate Guidelines Network (SIGN) methodology checklist for randomised controlled trials. In order to reduce bias in ratings, all included studies were rated on each criterion by three reviewers (LQ, CC and KP). Where there was disagreement, consensus was reached through discussion. Studies were then assigned ratings of overall quality and risk of bias³.

² Quality checklists are included in Thesis Appendices B and C.

³ Criteria for assessing study quality and risk of bias are listed in Thesis Appendix D.

Results

Search Results

The original searches resulted in a total of 1,147 articles excluding duplicates. The titles and abstracts were screened for applicability and those which were not relevant to the review question were excluded. Articles were deemed not relevant if they did not relate to psychosis or were medication-based studies. Non-intervention and qualitative studies were also excluded. This strategy resulted in 70 articles which were then reviewed in detail according to the stated inclusion and exclusion criteria. The number of excluded studies and reasons for exclusion are shown in Figure 1.

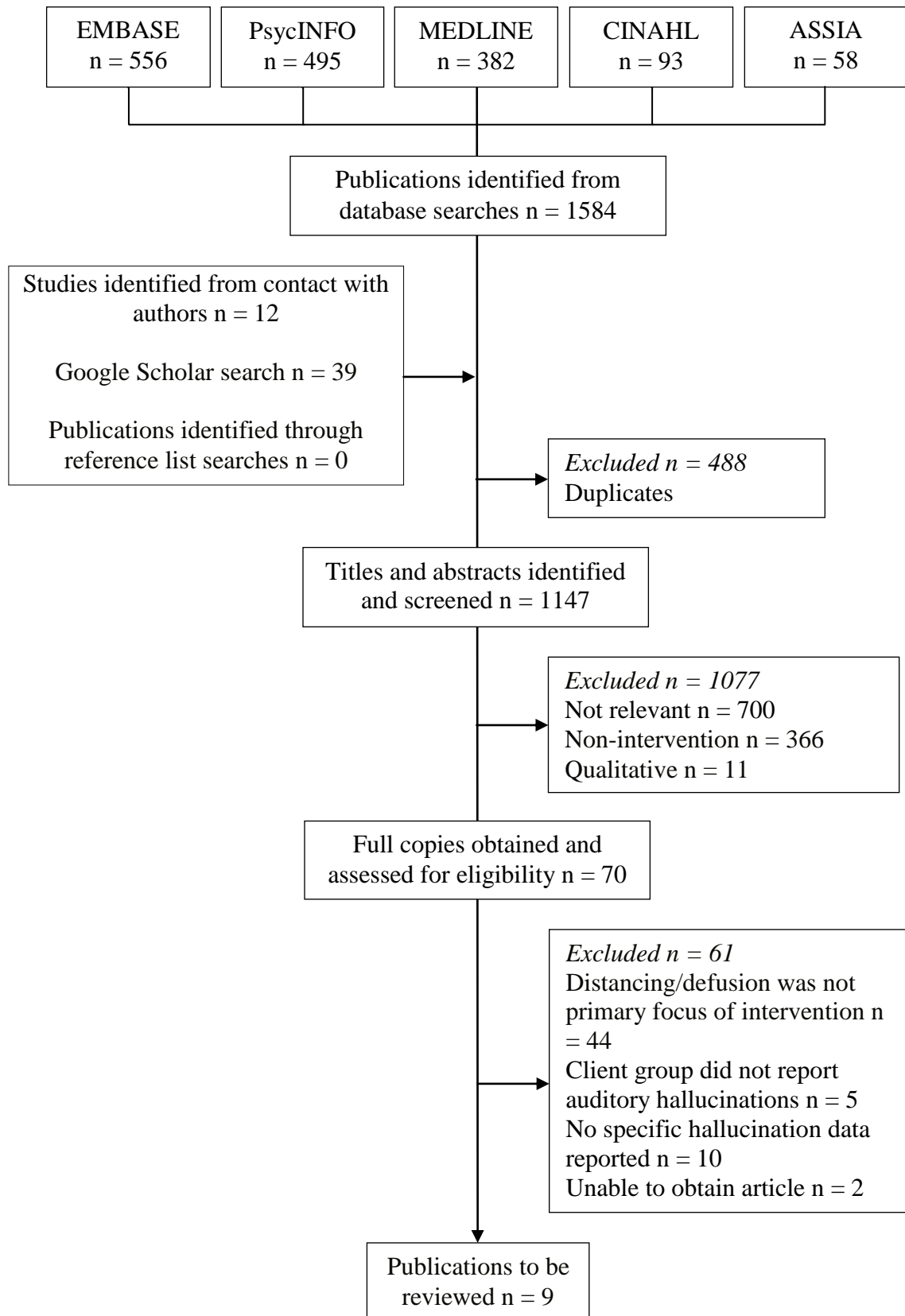


Figure 1: Flow chart of the selection process.

Following the selection process, four controlled studies and five case studies or case series met the inclusion criteria and were included in the review. Inter-rater agreement with regard to quality ratings was assessed using Fleiss' kappa statistic for multiple raters (Fleiss, 1971) and was rated as moderate ($k = 0.43$). Ten additional studies evaluating the effectiveness of mindfulness and acceptance-based therapies for psychotic symptoms were excluded because they did not contain any specific measure of hallucinations. Given the different methodologies and risk of bias, controlled and case studies are reviewed separately. The controlled studies are summarised in Table 1 and the case studies and case series are summarised in Table 2.

Table 1

Summary of Included Controlled Studies

Study	Participant description	Groups	N ^a	Hallucination measure	Follow-up	Within group pre-post effect ^b	Within group pre-follow-up effect ^b	Between group pre-post effect ^b	Between group pre-follow-up effect ^b
Langer et al. (2010) Spain	University students	MBCT	18	RHS + items rated 1 to 10 for distress and anxiety	Four months	No effect sizes reported or raw scores reported	No effect sizes reported or raw scores reported ^c	Hallucinations: 0.08	Hallucinations: -0.41
		Video forum	20					Distress: - 0.48 Anxiety: -0.88	Distress: -0.60 Anxiety: -0.91
Chadwick et al. (2009) UK	Outpatient, schizophrenia with distressing voices	Group-based Mindfulness	9	PSYRATS-AH BAVQ-R SMVQ	None	No significant differences in mean scores ^c	No follow-up	-0.26	No follow-up
		Waiting List + Group-based Mindfulness	9					-0.29 0.47	
Gaudio & Herbert (2006) USA	Inpatient, transdiagnostic	Individual ACT + ETAU	14	Self-reported: Frequency Distress Believability	Four months	-0.79 -0.63 -0.55	No hallucination measures taken at follow-up	-0.58	No hallucination measures taken at follow-up
		ETAU	15					-1.22 -1.42	
Bach & Hayes (2002) USA	Inpatient, transdiagnostic	Individual ACT + TAU	17	Self-reported symptoms at follow-up	Four months	Not reported	Not reported	Not reported separately for participants reporting hallucinations	9 in the ACT group reported hallucinations at follow-up, 3 in the control group ^c
		TAU	17						

Note: ACT: Acceptance and Commitment Therapy; BAVQ-R: Beliefs About Voices Questionnaire – Revised; BPRS: Brief Psychiatric Rating Scale; ETAU: enhanced treatment as usual; MBCT: Mindfulness-Based Cognitive Therapy; PSYRATS-AH: Psychiatric Symptom Rating Scale-Auditory Hallucinations; RHS: Revised Hallucination Scale; SMVQ: Southampton Mindfulness of Voices Questionnaire; TAU: treatment as usual.

^a N is the number of participants for whom data were entered into the final analysis and does not include those who dropped out. When studies include participants experiencing hallucinations and/or delusions, only data from participants with hallucinations are used, where available.

^b Effect sizes are reported as Cohen's *d*

^c Insufficient data to calculate effect size.

Table 2

Summary of Included Case Studies and Case Series

Study	Participant description	Groups	N ^a	Hallucination measure	Follow-up	Within group pre-post effect ^b	Within group pre-follow-up effect ^b
Gaudio et al. (2013) USA	Inpatient and outpatient, major depressive disorder with psychotic features	ADAPT	11	LSHS-R	Nine months	-0.59	-0.51
Newman Taylor et al. (2009) UK	Outpatient, schizophrenia	Individual mindfulness	2	SMVQ 11-point scale: Distress Belief conviction	Four to six weeks	2.36 -5.19 -2.85	1.49 -2.36 -3.03
Mayhew & Gilbert (2008) UK	Outpatient, schizophrenia	CMT	3	BAVQ VRS	Six months	-0.44 -0.23	-0.55 0.65
Viega-Martínez et al. (2008) Spain	Outpatient, schizophrenia	ACT	1	BPRS: hallucinations SEHV: Frequency Annoyance	Two weeks. No measures taken.	‘moderately severe’ to ‘mild’ ^c 4/7 to 3/7 ^c 3/7, no change ^c	No measures taken
Pankey & Hayes (2003) USA	Outpatient, schizophrenia with mild learning disability	ACT	1	10-point scale: Distress Believability Frequency	One month	Not reported	Distress: decrease from ‘8’ to ‘2’ ^c Believability and frequency: insufficient data ^c

Note: ADAPT: Acceptance-based Depression And Psychosis Therapy; BAVQ: Beliefs About Voices Questionnaire; BPRS: Brief Psychiatric Rating Scale; CMT: Compassionate Mind Training; LSHS-R: Launay–Slade Hallucinations Scale – Revised; SEHV: Scale for the Experience of Hearing Voices; SMVQ: Southampton Mindfulness of Voices Questionnaire; VRS: Voice Rank Scale

^aN is the number of participants for whom data were entered into the final analysis and does not include those who dropped out. When studies include participants experiencing hallucinations and/or delusions, only data from participants with hallucinations are used, where available.

^bEffect sizes are reported as Cohen’s *d*

^cInsufficient data to calculate effect sizes.

Quality of Controlled Studies

The overall quality of the controlled studies was poor based on the criteria developed for this review. One controlled study (Gaudiano & Herbert, 2006) was rated as reasonable and the remaining three were classed as methodologically limited. Best practise for controlled studies involves the direct comparison of two interventions (Guyatt, et al., 2011). None of the controlled studies in the review included a control group which received an alternative evidence-based psychological intervention. Just one study (Gaudiano & Herbert, 2006) included appropriate randomisation of participants to groups and intention-to-treat analysis. None of the studies included power calculations or used blind raters to obtain outcome data. Although interventions were well described in most cases, there was minimal information regarding checks of treatment fidelity. Just one study (Chadwick et al., 2009) used well-validated and reliable measures covering more than one aspect of hallucinations.⁴

Results from Controlled Studies

Distress due to hallucinations. Gaudiano and Herbert (2006) compared participants receiving between one and five sessions of ACT plus enhanced TAU with participants receiving enhanced TAU in an inpatient setting. Voice-related distress was measured using the following question: “On a scale from zero to 10, how bothered are you when you experience (specific hallucination)? Zero means not distressed at all and 10 means the most distressed you’ve ever been.” The ACT group reported a medium reduction in voice-related distress post-intervention ($d = -0.63$) and a large reduction in distress compared to the control group ($d = -1.22$). This

⁴ Quality ratings for controlled studies are listed in Thesis Appendix E.

measure was not repeated at follow-up. Langer et al. (2010) studied 38 university students who scored positively on the Revised Hallucinations Scale (RHS) and reported distress or anxiety as a result of these experiences. Participants were assigned to either eight sessions of Mindfulness-Based Cognitive Therapy (MBCT) or eight sessions of a video forum. Distress and anxiety were rated on a 10-point Likert scale for each endorsed item on the RHS. A small to medium reduction in distress ($d = -0.48$) was observed post-intervention in the MBCT group compared to the control group, increasing to a medium reduction in distress at four month follow-up ($d = -0.60$). Similarly, a large reduction in anxiety was observed ($d = -0.88$) post-intervention and at follow-up ($d = -0.91$) compared to the control group.

In addition, the study by Bach and Hayes (2002) compared participants who had received four sessions of ACT plus TAU in an inpatient setting with participants who had received TAU only. The study included participants experiencing hallucinations, delusions, or both. Participants experiencing both symptoms were asked to choose which symptom was most distressing and to rate the frequency, believability and distress caused by this symptom on a scale of zero to 100, pre- and post-intervention. Symptom-related distress reduced equally for both groups. However, the results were not reported separately for hallucinations and delusions therefore no firm conclusions about the impact of ACT voice-related distress can be drawn from this study.

Frequency and severity of hallucinations. Bach and Hayes (2002) found that participants who had received four sessions of ACT and TAU in an inpatient setting were three times more likely to report experiencing hallucinations at four month follow-up compared to participants who had received TAU only. The authors

also reported that there was no difference between groups at baseline or follow-up with regard to symptom frequency however this included participants experiencing hallucinations, delusions, or both. In a similar study, Gaudiano and Herbert (2006) reported a medium to large reduction ($d = -0.79$) in self-reported frequency of hallucinations amongst participants receiving between one and five sessions of individual ACT in addition to enhanced TAU in an inpatient setting. In addition, a medium reduction in frequency of hallucinations was reported for this group when compared to participants receiving enhanced TAU only ($d = -0.58$).

Chadwick et al. (2009) noted a small decrease in symptom severity as assessed using total Psychotic Symptoms Rating Scales – Auditory Hallucinations Rating Scale (PSYRATS-AH) scores ($d = -0.29$) after completion of a group-based mindfulness intervention compared to waiting list controls in an outpatient setting. Data were also combined to include pre- and post-intervention measures of waiting list controls who subsequently took part in a mindfulness group. Insufficient data were reported to allow within-group effect sizes to be calculated however there was no significant difference in PSYRATS-AH scores pre- and post-intervention with mean scores changing from 29.6 to 28.7. Langer et al. (2010) found no difference in hallucination frequency between university students completing a MBCT group and students taking part in a weekly film forum. However at four month follow-up, students who had taken part in the MBCT group reported a small to medium reduction in hallucination frequency compared to the control group ($d = -0.41$).

Belief conviction. Some degree of reduction in the extent to which participants rated their hallucinations as ‘real’ was reported in all three studies assessing believability of hallucinations although actual scores were only reported in

two of the studies. Gaudiano and Herbert (2006) asked participants to rate the extent to which they believed their hallucinations to be real: “On a scale from zero to 10, how much do you believe that when you experience (specific hallucination) that it is real? Zero means that you are certain it is not real or true, and 10 means you are absolutely certain that it is real or true.” The authors reported a medium reduction in believability amongst participants receiving between one and five sessions of ACT ($d = -0.55$) and a large reduction in symptom believability compared to the control group ($d = -1.42$).

In addition, Bach and Hayes (2002) reported a significantly larger reduction in symptom believability amongst participants who had received four sessions of individual ACT in an inpatient setting compared to the control group however this included participants experiencing either hallucinations or delusions.

Beliefs about hallucinations. Chadwick et al. (2009) reported a small reduction in overall scores on the Beliefs About Voice Questionnaire-Revised (BAVQ-R) amongst participants who had taken part in a group-based mindfulness intervention compared to waiting list controls ($d = -0.29$). Individual subscale scores were not reported.

Mindfulness of hallucinations. Chadwick et al. (2009) identified a small to medium increase ($d = 0.47$) in participants’ ability to respond mindfully to voices, noticing their experiences without attempting to struggle or avoid them, after completion of a group-based mindfulness intervention compared to waiting list controls. This study was methodologically limited however and was the only controlled study to assess mindfulness. As such, it is difficult to draw firm conclusions from this.

Quality of Case Studies and Case Series

Quality ratings for case studies and case series are listed in Table 5. Overall, the quality of these studies was variable. All studies provided detailed demographic information, were clinically relevant and adequately described aspects of treatment fidelity. However they failed to use raters blind to the intervention to assess outcomes and the use of standardised outcome measures was variable. One study (Gaudio et al., 2013) was rated as excellent and another (Mayhew & Gilbert, 2008) was rated as very good however the remaining studies included in the review were categorised as methodologically limited.⁵

Results from Case Studies and Case Series

Distress due to hallucinations. Newman Taylor et al. (2009) described a case series in which two men with long-standing hallucinations and a diagnosis of paranoid schizophrenia took part in 12 sessions of individual mindfulness. Participants were asked to answer the question “How distressing are your voices?” on an 11-point scale ranging from zero (not at all) to 10 (extremely/totally). A large reduction in distress was observed for both participants at the end of the intervention ($d = -5.19$) and at four or six week follow-up ($d = -2.36$). Pankey and Hayes (2003) described a case study in which a woman diagnosed with schizophrenia and a mild learning disability received four sessions of ACT. Self-reported distress related to her hallucinations was assessed on a weekly basis using a ten-point Likert scale. The level of distress reduced from eight out of 10 at session one to two out of 10 at one month follow-up. One case study reported no reduction in voice-related distress (Viega-Martínez et al., 2008). This case study described a man with distressing,

⁵ Quality criteria for case series and case studies are in Thesis Appendix F.

medication-resistant hallucinations and a diagnosis of paranoid schizophrenia who received 15 sessions of individual ACT. Prior to each session, the participant was asked to rate the annoyance he felt as a result of his hallucinations on a seven-point scale ranging from ‘not annoying’ to ‘very annoying’. No change in annoyance of hallucinations was observed.

Frequency and severity. In a case study of a woman with a learning disability and distressing hallucinations (Pankey & Hayes, 2003), frequency of symptoms was reported to have remained “fairly stable” throughout the intervention of four individual ACT sessions although exact data is not reported. Another case study by Viega-Martínez et al. (2008) found that severity of hallucinations before and after 15 sessions of individual ACT, as measured by item 10 of the clinician-rated Brief Psychiatric Rating Scale (BPRS), changed from “moderately severe: experiences daily hallucinations or some areas of functioning are disrupted by hallucinations” to “mild: while in a clear state of consciousness, hears a voice calling the individual's name, experiences non-verbal auditory hallucinations (e.g., sounds or whispers), formless visual hallucinations or has sensory experiences in the presence of a modality relevant stimulus (e.g., visual illusions) infrequently (e.g., 1-2 times per week) and with no functional impairment”. Frequency of hallucinations was also rated using a seven-point scale ranging from ‘not often’ to ‘constant’. Scores on this measure remained relatively constant suggesting that the change in BPRS item may have signified a change in the perceived disruption the hallucinations caused rather than reduced frequency.

Belief conviction. Newman Taylor et al. (2009) asked participants to rate the question “How much do you believe what the voices say?” on an 11-point scale

ranging from zero (not at all) to 10 (extremely/totally). The authors report a large reduction in belief conviction after 12 sessions of individual mindfulness ($d = -2.85$) and at four or six week follow-up ($d = -3.03$). Pankey and Hayes (2003) measured symptom believability on a weekly basis using a 10-point Likert scale as part of an ACT intervention with a woman diagnosed with schizophrenia and a learning disability. The authors state that there was a reduction in believability of symptoms however specific data in relation to believability of hallucinations was not reported.

Beliefs about hallucinations. Mayhew and Gilbert (2008) described a case series in which three adults with hostile hallucinations and a diagnosis of schizophrenia received 12 sessions of individual Compassionate Mind Training (CMT). A small reduction in overall beliefs about voices was observed post-intervention ($d = -0.44$) increasing to a medium reduction in beliefs about voices at six month follow-up ($d = -0.55$) as assessed using the BAVQ. Large reductions in self-reported malevolence of hallucinations at post-CMT intervention ($d = -1.02$) and six month follow-up ($d = -2.47$) were reported. Perceived power in relation to participants' hallucinations was assessed using the Voice Rank Scale (VRS), an 11-item scale designed to assess an individual's rank relative to their dominant hallucination. Higher scores signify that the person places themselves at a higher rank than their voices. No change in VRS scores was observed post-intervention ($d = 0.14$), however there was a moderate increase in perceived rank compared to the dominant hallucination at six month follow-up ($d = 0.65$).

Mindfulness of hallucinations. In a case series including two participants who received 12 sessions of individual mindfulness, Newman Taylor et al. (2009)

reported a large increase in participants' ability to respond mindfully voices at post-intervention ($d = 2.36$) and four to six week follow-up ($d = 1.49$).

Hallucination proneness. One study (Gaudiano et al., 2013) assessed changes in proneness to hallucinations in a sample of participants with a diagnosis of major depressive disorder with psychotic features. Of the 14 participants, nine reported a history of hallucinations and 12 had experienced delusions. Eleven participants completed treatment and follow-up measures, completing an average of 21 sessions of Acceptance-Based Depression and Psychosis Therapy (ADAPT). A medium reduction in hallucination proneness was observed at the post-intervention stage ($d = -0.59$) which was maintained at nine month follow-up ($d = -0.51$).

Comparison of Results

Decreases in voice-related distress were observed in four of the five studies reporting this outcome. One case study (Viega-Martínez et al., 2008) found no reduction in voice-related distress however this involved a measurement of the annoyance of the participant's hallucinations which could be seen as a separate construct to distress. Much larger effect sizes were obtained in the case studies than studies incorporating a control group. Six studies in the review included at least one measure of frequency or severity of hallucinations. The results from controlled studies ranged from an increase in reported frequency (Bach & Hayes, 2002) to no change (Langer et al., 2010) and a reduction in reported frequency (Gaudiano & Herbert, 2006). Results in the case studies were similarly variable, ranging from no change (Pankey & Hayes, 2003) to a reduction in severity (Viega-Martínez et al., 2008).

A reduction in participants' believability of hallucinations subsequent to intervention was reported in both controlled studies and case studies. Only two studies provided enough data to calculate effect sizes. Amongst these, the controlled study (Gaudio & Herbert, 2006) found a medium reduction whereas a large reduction in believability was observed in the case study (Newman Taylor et al., 2009). Two studies assessed changes in key beliefs about hallucinations including beliefs about voice content, power, purpose and the consequences of listening to the voice. Both the controlled study (Chadwick et al., 2009) and case study (Mayhew & Gilbert, 2008) reported small reductions in overall beliefs about voices post-intervention. Similar results were observed between the controlled study and case series in which participants' mindfulness of hallucinations was measured. Although both studies identified increases in mindfulness of hallucinations subsequent to a mindfulness-based intervention, this effect was significantly larger in the case study (Newman Taylor et al., 2009).

Discussion

The aim of the review was to evaluate the impact of mindfulness and acceptance-based therapies on distressing auditory hallucinations. The size and design of the studies varied greatly, ranging from a randomised controlled trial to case studies. The methodological quality of the included studies was poor based on the criteria developed for this review. These included AVH-focussed criteria such as the use of well-validated and reliable measures covering more than one aspect of hallucinations and the inclusion of a hallucination measure at follow-up which may not have been the focus of the studies. Nevertheless, just one study incorporated appropriate randomisation and intention-to-treat analysis, blind raters were not used

in any of the studies and power calculations were not reported. Information regarding methods to ensure treatment fidelity was limited.

Overall these studies suggest that mindfulness and acceptance-based therapies may have a beneficial effect on distress related to hallucinations. A moderate to large reduction in voice-related distress was noted in most studies and this was maintained at follow-up, where assessed. Mindfulness and acceptance-based therapies had a greater impact on voice-related distress than enhanced TAU and a weekly video forum. Unlike other studies measuring voice-related distress, the study in which a reduction was not observed (Viega-Martínez et al., 2008) included a self-report measure of ‘annoyance’ of hallucinations which may constitute a separate construct. These results are broadly consistent with recent findings by Khoury et al. (2013) who reported a small beneficial effect of mindfulness-based therapies on affective symptoms in participants with psychotic disorders. The present review explored distress specifically due to hallucinations whereas the meta-analysis (Khoury et al., 2013) included measures of general distress which may account for the disparity in effect size. In addition, both reviews contained a relatively small number of studies, and as such may be affected by bias.

Mindfulness and acceptance-based therapies do not focus on directly reducing psychotic symptoms, but attempt to decrease their negative impact by altering the patient’s relationship to symptoms (Gaudiano et al., 2010). They aim to facilitate non-judgemental awareness and objectivity towards experiences. As such, the extent to which participants believe their hallucinations to be ‘real’ is predicted to reduce. This is supported by the results of studies included in the review.

Believability of hallucinations reduced in all three studies in which this construct was measured.

Although reduction of symptoms is not an aim, symptom frequency was the most common outcome measure amongst the studies in this review. The results were variable with decreases observed in some studies while others reported no change. In one study (Bach & Hayes, 2002), more participants in the ACT group reported symptoms at follow-up than controls. The authors suggested that this result may have been a consequence of a more accepting stance towards symptoms amongst the ACT group as opposed to a genuinely higher rate of symptoms. It is possible that creating distance between themselves and their hallucinations allowed participants to be more open about their experiences however the opposing results from a study using a similar intervention and participant group suggest that this may not be the case. It would be helpful for future studies to assess acceptance of voices in addition to reported frequency in order to clarify whether such a relationship exists.

Hallucination-proneness was assessed in one study and a moderate decrease was found. As participants included those with and without hallucinations, it is difficult to draw conclusions from this. Similarly, appraisals of the content of hallucinations are not typically a focus of mindfulness and acceptance-based therapies. However, in the two studies in which beliefs about voices were assessed, mindfulness and CMT resulted in small reductions in overall beliefs about voices. Just one study (Mayhew & Gilbert, 2008) provided information on appraisals of malevolence and power. In both cases, such appraisals reduced.

Although the present review explored mindfulness specifically in relation to hallucinations, the results are broadly consistent with findings by Khoury et al.

(2013) who observed large increases in overall mindfulness following mindfulness-based therapy, and that gains were maintained at the follow-up. They also found that study quality was shown to negatively moderate the efficacy of mindfulness-based therapy, suggesting expectancy effects and other biases. The ability to respond mindfully to hallucinations increased subsequent to mindfulness interventions in both studies included in the present review. Similarly to Khoury et al. (2013), a smaller effect was found in the controlled study than in the case series. It is unclear whether this difference was due to the more rigorous methodology of the controlled study, a dilution of large effects by smaller effects (i.e. regression to the mean) or a difference in efficacy between group-based and individual mindfulness interventions. Overall, however, the results suggest that mindfulness-based interventions increase participants' ability to respond to internal experiences in a mindful way.

Strengths and Limitations of the Review

To ensure that all relevant data was included and the potential for publication bias was reduced, the authors of included studies were contacted to identify any unpublished and in press articles. A transparent process of methodological review was developed and the studies were independently reviewed by three raters in order to reduce potential for subjective bias. Many of the studies included participants with long-standing auditory hallucinations in addition to other mental health difficulties and are likely to be representative of individuals treated within mental health services. The specific nature of the review was an additional strength consistent with the 'complaint-orientated approach' advocated by Bentall (2006).

The review has several limitations. The lack of randomised controlled studies in which a hallucination-specific outcome measure was used necessitated the

inclusion of smaller, lower quality studies in this review. This introduced an increased risk of bias. In addition, the outcomes assessed varied widely from study to study therefore many results have been based on a particularly small number of studies. In many cases, well-validated measures were either not available or not used.

Hallucination-specific measures have been developed for general concepts such as psychological flexibility (Voices Acceptance and Action Scale) and mindfulness (Southampton Mindfulness Voices Questionnaire). Yet, to the author's knowledge, there is currently no validated measure of voice-related distress. As such, researchers have been required to choose between using a psychometrically sound measure of general distress that lacks specificity or non-validated measures of voice-related distress such as Likert scales. Measures of general distress were not reported in this review. Mindfulness and acceptance-based therapies typically do not focus specifically on hallucinatory experiences themselves, instead aiming to alter the patient's relationship to distressing experiences. As such, it would not be possible using general measures to ascertain whether any change to psychological distress was a consequence of a more mindful and willing stance towards hallucinations or to other factors.

Implications for Clinical Work and Future Research

The results of the review suggest that mindfulness and acceptance-based therapies may result in a number of beneficial effects such as reducing voice-related distress, increasing mindfulness and reducing belief conviction. However given the small numbers of studies and high risk of bias, firm conclusions about the efficacy of such therapies cannot be drawn and they cannot yet be considered evidence-based

treatments for distressing hallucinations. Larger, more methodologically rigorous studies are required.

Despite the increasing popularity and developing evidence base of mindfulness and acceptance-based therapies for psychosis more generally, changes relating to specific symptoms are not routinely assessed. Delusions, hallucinations and thought disorder are often amalgamated into one construct of ‘psychotic’ or ‘positive’ symptoms. Although these symptoms frequently occur together, they can also occur independently and the prevalence of auditory hallucinations is higher than that of schizophrenia for example. In addition to allowing the development of more individually-tailored interventions, symptom-specific outcomes provide greater opportunity to investigate specific mechanism of change.

Conclusions

The literature regarding mindfulness and acceptance-based therapies for the treatment of distressing hallucinations is limited at present. Beneficial effects were noted in almost all aspects of hallucinations including distress, belief conviction and mindfulness of hallucinations. However, the small number of studies and significant methodological limitations of the studies included in the review mean that firm conclusions about the benefits of mindfulness and acceptance-based therapies for distressing hallucinations cannot be made at present. There is a lack of specificity in outcomes reported in many intervention studies evaluating the use of mindfulness and acceptance-based therapies with individuals with psychotic symptoms.

The following recommendations are made with respect to future research:

- Specific outcome measures assessing aspects of auditory hallucinations should be included in order to elucidate changes brought about by the intervention. These

should include general measures of frequency and severity e.g. PSYRATS-AH, and measures of proposed mechanisms of change within the intervention studied.

- Researchers should consider providing a detailed account of the data including means, standard deviations and changes in measure scores to allow comparison with other studies.
- Where studies include participants reporting positive symptoms in general, non-specific outcomes such as psychological distress and quality of life should be reported separately for the subset of participants who experience hallucinations in addition to reporting outcomes for the group as a whole. For example, supplementary information could be made available in online journal repositories.
- A robust measure of voice-related distress should be developed and validated to allow for more reliable assessment of changes brought about by psychological interventions.

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CHAPTER 2: JOURNAL ARTICLE

Negative Self-Schemas and Psychological Flexibility Influence Distress due to
Auditory Hallucinations⁶

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Abstract

Introduction. The relationship between malevolent and omnipotent appraisals of voices and psychological distress is relatively well-established. It was hypothesised that negative self-schemas mediate the relationship between negative appraisals and voice-related distress. In addition, psychological flexibility was hypothesised to weaken these relationships.

Method. Forty-four participants who had reported experiencing auditory hallucinations within the past two months were recruited from community mental health and inpatient services. Participants completed a demographic questionnaire and clinical measures relating to self-schemas, beliefs and attitudes towards voices, general mood and symptom severity.

Results. Negative self-schemas were found to mediate the relationship between omnipotent appraisals and voice-related distress but not malevolent appraisals and voice-related distress. Psychological flexibility moderated the relationship between malevolent appraisals and voice-related distress. At high levels, psychological flexibility was also found to moderate the impact of omnipotent appraisals on voice-related distress.

Discussion. The results suggest that both negative self-schemas and psychological flexibility may be useful targets for psychological therapy for distressing auditory hallucinations. In addition, the results highlight the importance of assessing an individual's beliefs about their hallucinations when considering treatment options.

Keywords: hallucinations, voices, self-concept, self-esteem, psychological flexibility, acceptance

Highlights

- Forty-four participants completed measures of hallucinations, mood and self-schemas.
- No relationship was found between voice-related distress and depressed mood.
- Negative self-schemas mediate the omnipotence/voice-related distress relationship.
- Self-schemas had no effect on the malevolence/voice-related distress relationship.
- Psychological flexibility weakened the impact of negative appraisals on distress.

Negative Self-Schemas and Psychological Flexibility Influence Distress due to Auditory Hallucinations

Auditory verbal hallucinations (AVH) are listed as a core feature of psychosis in both the Diagnostic and Statistical Manual of Mental Disorders and the International Classification of Diseases. Although frequently associated with schizophrenia, AVH are experienced by individuals with a variety of psychiatric diagnoses and in the general population. Prevalence rates of 75% in patients diagnosed with schizophrenia, 72% in patients diagnosed with schizoaffective disorder and 34% in those with a diagnosis of bipolar disorder have been reported (Shinn et al., 2012). Kingdon et al. (2010) reported a prevalence rate of 50% amongst those diagnosed with Borderline Personality Disorder. Beavan et al. (2011) reviewed 17 studies investigating the prevalence of AVH in the general adult population across nine countries. Prevalence rates ranged widely due to differences in methodologies and definitions of AVH however the authors reported an interquartile range of 3.1%–19.5% and a median of 13.2%.

There is ongoing debate about whether AVH associated with psychotic disorders such as schizophrenia are distinct from those that occur in the absence of mental illness. There is however a range of evidence suggesting that AVH are not phenomenologically different in those with a psychiatric diagnosis and those without. Results from recent functional magnetic resonance imaging (fMRI) studies suggest that AVH activate the same brain regions in clinical and non-clinical populations. For example, Diederer et al. (2012) studied brain activation during AVH in 21 non-clinical participants and 21 matched psychotic patients using 3T fMRI scanning. They found that several common areas of activation were present for the clinical and

non-clinical groups while no significant differences in brain activation between the groups could be observed. In both groups, the bilateral inferior frontal gyri, insula, superior temporal gyri, supramarginal gyri, postcentral gyri, left precentral gyrus, inferior parietal lobule, superior temporal pole, and right cerebellum were significantly activated during the occurrence of AVH. In addition, it has been well established that AVH in both clinical and non-clinical populations are frequently triggered by traumatic events or memories of previous traumatic events (e.g. Daalman et al., 2012).

In one of the few qualitative studies investigating psychotic-like experiences in clinical and non-clinical populations, Jackson and Fulford (1997) found that in both groups, these symptoms originally occurred subsequent to periods of intense stress. The authors reported that triggering events were similar between the clinical and non-clinical groups however the groups differed with regard to ‘the way in which psychotic phenomena are embedded in the values and beliefs of the person’ (Jackson & Fulford, 1997, p. 41). Heriot-Maitland et al. (2012) used interpretative phenomenological analysis to identify themes in the subjective experiences of 12 participants who reported ‘out-of-the-ordinary’ experiences including hearing voices. These were divided into those who had accessed mental health services as a result of their experiences and those who had not. In line with findings from Jackson and Fulford (1997), similarities between the groups were noted with regard to the triggers and subjective nature of the experiences. Participants in both groups reported that their experiences initially began during periods of significant negative emotion, social isolation and ‘deep contemplation about the meaning and direction of life’.

The groups differed in the extent to which they were able to incorporate these experiences into their lives.

This suggests that certain factors common to both clinical and non-clinical groups may be involved in the initial development of AVH (i.e. trauma, social isolation, significant emotional stress) while different factors may be involved in the subsequent impact of AVH on mood and functioning. Heriot-Maitland et al. (2012) concluded 'It is not the out-of-the-ordinary experience itself that determines the development of a clinical condition, but rather the wider personal and interpersonal contexts that influence how this experience is subsequently integrated' (p. 37).

The Role of Cognitive Appraisals in Voice-Related Distress

The cognitive model of AVH proposes that the ways in which an individual appraises the experience of hearing voices will influence the consequent emotional and behavioural responses (e.g. Chadwick & Birchwood, 1994). This relationship can be viewed as bi-directional in that emotional and behavioural responses to AVH can also influence the cognitive appraisals made about them (Morrison et al., 1995). For example, in a study of 49 patients who experienced AVH and had been diagnosed with schizophrenia, schizoaffective or schizophreniform disorder, Morrison et al. (2003) found that metaphysical beliefs about AVH such as 'They mean I am possessed', 'They mean I have done something bad' predicted distress. It has been suggested that such interpretations impact distress by contributing to the use of safety behaviours (Nothard et al., 2008).

Mawson et al. (2010) reviewed 26 studies measuring voice hearers' psychological distress, including depression and anxiety, and cognitive appraisals of their voices such as beliefs about meaning, power and intrusiveness. Sample sizes

ranged from 12 to 199, the average sample size was 53. Malevolence was consistently associated with distress, anxiety and depressed mood and remained an independent predictor of distress after controlling for variables such as voice frequency and illness duration. Three studies included in the review (Trower et al., 2004; Valmaggia et al., 2005; Wykes et al., 1999) measured malevolent voice appraisals and distress as part of their outcome assessment subsequent to a Cognitive Behavioural Therapy (CBT) intervention. In all three studies, changes to distress and voice malevolence following treatment were not significant.

For the purpose of their review, ‘voice supremacy’ included appraisals of voices as intrusive and controlling, dominant, powerful or superior. Voice supremacy measures were found to be independent predictors of distress and remained significant after controlling for a variety of factors such as voice frequency, duration and behavioural responses. Voices high in supremacy were hypothesised to contribute to feelings of shame and humiliation and were associated with feelings of ‘entrapment’ (e.g. Birchwood et al., 2004). Two studies included in the review (Birchwood et al., 2000; 2004) with a sample size of 59 and 125 respectively, suggested that the relationship between voice supremacy and psychological distress may be mediated by social schemas. Those who appraised their voices as powerful were more likely to report feelings of powerlessness in social relationships than those who appraised their voices as low in power. The relationships observed between cognitive appraisals of voices and distress provides support for the cognitive model of AVH.

Self-Schemas and Voice-Related Distress

Given the modest effect of CBT on distress reduction in the included studies, Mawson et al. (2010) concluded that mediating variables, such as social schemas, may exist within the appraisal–distress relationship. Social schemas help individuals to interpret and order social experiences and responses and are conceptually linked to self-esteem which can be defined as appraisals about the self relative to others (Paulik, 2010). Low self-esteem is common amongst individuals with psychosis (Freeman et al., 1998) and negative self-evaluation is particularly associated with AVH containing negative content (Close & Garety, 1998). Smith et al. (2006) found that individuals with low self-esteem and a greater degree of negative self-evaluative beliefs reported greater distress as a result of their AVH whereas negative evaluations about others were not associated with distress. Paulik (2012) reviewed 13 studies investigating the role of social schemas in AVH. Sample sizes range from five to 116, with a mean sample size of 36. Paulik concluded that voice hearers who view themselves as inferior to others also feel inferior to their voice and respond accordingly. As such, Paulik advocated for an extension of the cognitive model of AVH to include the mediating role of social schemas in explaining the affective and behavioural responses to voices whilst noting that further empirical investigation was needed.

To the author’s knowledge, just one study (Fannon et al., 2009) has investigated the mediating effect of self-esteem on the relationship between appraisals and distress. Fannon et al. assessed the mediating effect of self-esteem on the relationship between depression and one item on the BAVQ-R: “My voice rules

my life”. They found that self-esteem independently predicted depression but did not mediate the relationship between voice dominance and depression.

Psychological Flexibility

There has been little empirical investigation of the impact of psychological flexibility on voice-related distress. Just one study in Mawson et al.’s (2010) review of cognitive factors in voice-related distress investigated psychological flexibility. Psychological flexibility has been described as “the ability to be fully conscious and open to our experiences so we can act on our values” (Harris, 2009, p.8). The term refers to six core processes which include developing an increased awareness of experiences in an objective way and reducing the extent to which thoughts are seen as unarguable truths. Shawyer et al. (2007) developed the Voices Acceptance and Action Scale (VAAS) to measure psychological flexibility and valued action as opposed to acting in accordance with voices. In a sample of 43 participants with command hallucinations, scores on the VAAS were negatively correlated with depression and positively correlated with satisfaction with general activities of life and ability to function in society. They also reported that the VAAS added substantially to the prediction of outcome with respect to depression, coping with command hallucinations and quality of life in addition to the variance accounted for by the BAVQ-R. In a study of 29 voice hearers, Gaudio et al. (2010) found that the believability of hallucinations, the extent to which participants took a cognitively detached stance toward their experiences, subsequent to engaging in Acceptance and Commitment Therapy (ACT) partially mediated the effect of treatment condition on voice-related distress.

Aims and Rationale for the Study

The relationship between malevolent and omnipotent appraisals of voices and psychological distress is relatively well-established. However interventions aiming to directly alter such appraisals have resulted in modest beneficial effects. The present study aims to further elucidate the relationship between appraisals and distress by investigating two potential factors. Firstly, the potential mediating role of negative self-schemas is investigated. It has been suggested that the relationships between appraisals and distress may be mediated by other factors such as social schemas and self-esteem. Given the prevalence of low self-esteem amongst individuals with psychosis, it is possible that the experience of hearing voices perceived as malevolent or omnipotent serves to strengthen the negative self-schemas an individual holds, which in turn contributes to psychological distress. To the authors' knowledge, this is the first study to explore the mediating role of negative self-schemas on the relationship between malevolent and omnipotent appraisals and voice-related distress.

Secondly, it is possible that the strength of the relationship between voices viewed as malevolent or omnipotent and subsequent distress is influenced by an individual's ability to view internal experiences such as hallucinations from a detached stance. In other words, a higher degree of psychological flexibility would weaken the direct effect of malevolent and omnipotent voices on subsequent psychological distress. No study to date has investigated the moderating role of psychological flexibility on the relationship between negative voice appraisals and voice-related distress.

Method

Participants

Participants were 44 inpatient and outpatient adults recruited via a member of their Community Mental Health Team (CMHT), day service or inpatient psychiatric service. Fifty four individuals were invited to participate in the study and declined, resulting in a response rate of 45%. An additional 32 patients were identified by members of their care team but did not fit criteria or disengaged from services prior to being approached to take part. Individuals were approached by a member of their team if they were receiving care from either a CMHT or psychiatric inpatient service, had reported hearing voices within the past two months, were fluent in the English language and were capable of providing informed consent as assessed by their psychiatrist or another key member of their mental health team. Potential participants were excluded if they had a diagnosed learning disability or experienced voices as a direct result of substance misuse or a non-psychiatric medical condition (e.g. acquired brain injury, tumour, dementia).

Sixty-four percent of participants were male, 73% were outpatients at the time of the study and almost all (98%) identified as White Scottish or White British. The majority (73%) were not currently in a long-term relationship and only 5% were in full-time employment or education. The duration of voice hearing in years ranged from zero to 36 ($M = 15.16$, $SD = 11.52$). The total number of psychiatric hospitalisations for each participant ranged from zero to 50 ($M = 5.32$, $SD = 8.81$) and 73% experienced command hallucinations. Psychiatric characteristics of participants are detailed in Table 1. Schizophrenia was the most common psychiatric

diagnosis followed by borderline personality disorder. Primary psychiatric diagnoses classified as ‘other’ included anorexia, depression and anxiety.

Socio-economic status was determined by postal code, using the Scottish Index of Multiple Deprivation (SIMD) 10-point scale, with one indicating greatest deprivation and 10 indicating least deprivation (Scottish Government, 2012). Eighty-one percent of the sample lived in areas corresponding to the five most deprived SIMD categories, 35% lived within the two most deprived categories.

Table 1

Psychiatric Characteristics of Participants

Characteristic		Frequency	
		n	%
Primary psychiatric diagnosis	Schizophrenia	22	51.2
	Borderline personality disorder	8	18.2
	Bipolar disorder	3	6.8
	Schizoaffective disorder	2	4.5
	Depression with psychotic features	3	6.8
	Psychosis not otherwise specified	1	2.3
	Other	5	11.4
Medication	Antipsychotic	43	97.7
	Antidepressant	30	68.2
	Anxiolytic	7	15.9
	Mood stabiliser	6	13.6
	Sleeping medication	7	15.9
Number of voices	1	14	31.8
	2-3	16	36.4
	4-6	8	18.2
	7 or more	6	13.7
Most recent hallucination	Within the past week	39	88.6
	Between 1 week and 1 month ago	4	9.1
	Between 1 month and 3 months ago	1	2.3
Most recent command	Within the past week	19	59.4
	Between one week and one month ago	11	34.4
	Between 4 months and 6 months ago	2	6.3

Measures

As part of a structured clinical interview, participants completed five measures which examined the characteristics of AVH, beliefs about voices, psychological flexibility, self-schemas and depression as outlined below.

The Psychotic Symptom Rating Scales – Auditory Hallucinations Rating Scale. The PSYRATS-AH (Haddock et al., 1999) was used to obtain descriptive information about participants' AVH. It is a structured interview consisting of 11 items assessing aspects of AVH on the following dimensions: frequency, duration, location, loudness, beliefs about the origin of voices, amount and degree of negative content, amount and intensity of distress, disruption caused by voices and the level of control the respondent has over their voices. Scores for each dimension range from zero to four with higher scores indicating greater severity of symptoms. It can be summed to give a total continuous variable for AVH with higher scores indicating higher severity of symptoms. The PSYRATS-AH has been used extensively in both clinical and non-clinical populations of voice-hearers. It has excellent reliability (0.99 to 1.00) and good validity as assessed using the hallucinations item on the Positive and Negative Syndrome Scale (Spearman's correlation coefficient = 0.81) (Haddock et al., 1999).

In order to assess participants' distress which was specifically attributable to AVH, the PSYRATS items corresponding to the amount and intensity of distress were summed to obtain a score of voice-related distress. Steel et al. (2007) stated that further research is needed to clarify the best use of potential PSYRATS subscales and recommend presenting data "both as a total score, but also with reference to the key single items of relevance to a particular study".

The Beliefs About Voices Questionnaire – Revised. The BAVQ-R

(Chadwick et al., 2000) is a 35-item self-report questionnaire designed to measure key beliefs about voices and emotional and behavioural responses. The questionnaire is divided into five subscales: malevolence, benevolence, omnipotence, resistance and engagement. Items are assessed on a four-point scale ranging from 'Disagree' to 'Strongly agree'. Higher scores indicate a higher tendency to make the associated appraisal or response. The scale has good reliability with Cronbach's α of 0.86, ranging from 0.74 to 0.88 for each subscale (Chadwick et al., 2000).

The Voices Acceptance and Action Scale. The VAAS (Shawyer et al.,

2007) is a self-report questionnaire developed to measure psychological flexibility in relation to AVH. It consists of 31 items and has a similar format to the BAVQ-R. Higher scores indicate greater psychological flexibility. The scale has excellent reliability with Cronbach's α of 0.90 for the full scale with subscale scores ranging from 0.76 to 0.85, and does not correlate with severity of symptoms as measured by the PSYRATS-AH. (Shawyer et al., 2007).

Brief Core Schema Scales. The BCSS (Fowler et al., 2006) is a 24-item self-

report questionnaire designed to assess evaluative beliefs about the self and others. It comprises four subscales: negative self, positive self, negative other and positive other. Statements are scored using a five-point rating scale ranging from 'No' to 'Believe it totally'. Higher scores signify a greater level of positive and negative beliefs. Fowler et al. (2006) reported that the scale is more independent of mood than the Rosenberg Self-Esteem Scale and has good reliability. Cronbach's α coefficients have been reported at > 0.78 (Fowler et al., 2006).

The Calgary Depression Scale for Schizophrenia. The CDSS (Addington et al., 1990) is a nine-item structured interview which aims to measure symptoms of depression over the past two weeks. Items are scored on a four point scale ranging from ‘Absent’ to ‘Severe’ with higher scores signifying more severe depressive symptoms. The authors report that the CDSS is less confounded by positive and negative symptoms than the Hamilton Depression Rating Scale and recommend its use in studies seeking to investigate depression independently from positive, negative and extrapyramidal symptoms (Addington et al., 1996). The scale has been shown to have good validity and reliability with a Cronbach's α coefficient of .79 (e.g. Addington et al., 1992).

Demographic information. The following demographic information was also collected during the interviews: gender, age, ethnicity, employment and marital status, postcode, diagnosis, age of onset of AVH, number of voices, current psychiatric medication and number of previous psychiatric hospitalisations.

Procedure

Information about the study was provided to members of seven CMHTs and two inpatient psychiatric services. Teams were asked to identify patients on their caseloads who met the inclusion and exclusion criteria and inform them of the study. Potential participants were provided with a Participant Information Sheet⁷ and asked if they were willing to be contacted by the researcher in order to discuss the study further. Potential participants were then given at least 48 hours to consider the information provided before being contacted. During this contact, any questions were answered and an appointment was arranged at an NHS location or in the participant's

⁷ Participant Information Sheet and Consent Form are provided in Thesis Appendices E and F.

home. During the appointment, written consent and demographic information was collected, in addition to the five measures outlined above. These were administered in varying order to counterbalance any fatigue or order effects. Participants were given the option of having the self-report questionnaires read aloud to them by the researcher if they preferred. Participants were also given the option of receiving a written summary of the data upon completion of the study.

The project was reviewed internally by the University of Edinburgh and ethical approval was granted by the East of Scotland Research Ethics Committee (Reference number 13/ES/0080).⁸

Statistical Analysis

All data were analysed using SPSS 19.0 for Windows. As the overall sample was less than 100, variables with z-scores between 2.58 and -2.58 were considered to be normally distributed. Where skewness was observed, data were winsorised to achieve normality. Correlations were conducted between all study variables. The mediating effect of negative self-schemas on the relationship between malevolent appraisals and voice-related distress and between omnipotent appraisals and voice-related distress was assessed. In addition, the moderating effect of psychological flexibility on the relationship between voice appraisals and voice-related distress was explored. The bias-corrected bootstrapping method (Hayes, 2009; Preacher & Hayes, 2008) was used, as recommended by Fritz and MacKinnon (2007). Although this approach does not require a specific sample size, a sample size of 71 is recommended for detecting a medium effect size of the indirect effect (Fritz & MacKinnon, 2007). In terms of estimating likely effect sizes for the purpose of

⁸ Ethical approval paperwork is provided in the Thesis Appendix G.

sample size calculation, one previous study has used the VAAS to investigate the impact of psychological flexibility on distress in voice-hearers. Shawyer et al. (2007) report that scores on the VAAS accounted for a large proportion of the variance in depression in a clinical sample of voice hearers ($R^2 = 0.26$). Additionally, medium effect sizes of malevolent appraisals of voices on depression ($R^2 = 0.14$) and omnipotence appraisals of voices on depression ($R^2 = 0.19$) have been reported using the BAVQ-R and HADS (Chadwick et al., 2000).

In line with recommendations by Preacher and Hayes (2004), indirect effects were investigated using a bias-corrected 95% confidence interval (CI) with 5000 bootstrap samples. A mediation or moderation effect is significant if the upper and lower bounds of the CI do not contain zero. Moderation analyses were mean-centered. The mediation and moderation analyses were conducted using the PROCESS macro for SPSS (Hayes, 2012).

Results

Preliminary Analysis

Missing data analysis revealed that 0.4% of all response items were missing. Little's MCAR test was not significant, $X^2(335) = 323.23$, $p = .668$ indicating that these responses were missing at random. Due to the small proportion of missing data, missing values were replaced with the participants' mean scores for the relevant scale or subscale. Total scores on appraisals of malevolence and omnipotence, negative self-schemas, psychological flexibility and depression were found to be normally distributed. Severity of hallucinations as assessed using total PSYRATS-AH scores and voice-related distress as assessed by items eight and nine of the PSYRATS-AH

were both positively skewed. These data were winsorised for two and three participants respectively and normality was achieved. Mean scores, standard deviations and ranges for all variables are listed in Table 2.

Table 2

Mean, Standard Deviation and Range of Scores on all Measures

Measure	n = 44		Comparison studies	
	Mean (SD)	Range	Mean (SD)	
CDSS	10.50 (4.93)	0 - 19	8.9 (6.8) ^a	
PSYRATS	29.41 (5.34)	18 - 37	18.34 (14.49) ^b	28.8 (5.1) ^c
PSYRATS distress	5.88 (1.55)	3 - 8	5.1 (2.5) ^d	
BAVQ-R malevolence	10.14 (4.97)	0 - 18	9.5 (4.9) ^c	
BAVQ-R omnipotence	11.36 (4.18)	3 - 18	9.8 (3.1) ^a	9.3 (3.6) ^c
BCSS negative self	8.55 (6.54)	0 - 21	7.92 (5.93) ^b	
VAAS-A	38.45 (7.74)	19 - 51	36.44 (7.05) ^e	

Note: CDSS = Calgary Depression Scale for Schizophrenia total score, PSYRATS = Psychotic Symptoms Rating Scales - Auditory Hallucinations total score, PSYRATS distress = Psychotic Symptoms Rating Scales – Auditory Hallucinations distress subscale, BAVQ-R malevolence = Beliefs About Voices Questionnaire -Revised malevolence subscale, BAVQ-R omnipotence = Beliefs About Voices Questionnaire-Revised omnipotence subscale, BCSS negative self = Brief Core Schema Scales negative self subscale, VAAS-A = Voices Acceptance and Action Scale subscale A.

^aTrower et al. (2004), ^bSmith et al. (2006), ^cPenn et al. (2009), ^dShawyer et al. (2012), ^eShawyer et al. (2007)

Pearson correlation coefficients between depressive symptoms, voice related-distress, voice appraisals, negative self-schemas and psychological flexibility are provided in Table 3. In line with previous research, it was hypothesised that appraisals of voice malevolence and omnipotence would be associated with increased psychological distress. This hypothesis was partially supported. No significant correlation was observed between participants' general depressive symptoms and appraisals of malevolence, $r = .26$, $p = .102$, or omnipotence, $r = .25$, $p = .122$. Correlations were observed between voice appraisals and voice-related distress as assessed using the distress items on the PSYRATS-AH however. Malevolent appraisals were very strongly correlated with voice-related distress, $r = .70$, $p < .001$. Similarly, appraisals of omnipotence and voice-related distress were strongly correlated, $r = .52$, $p = .001$.

Table 3

Correlations among Distress, Appraisals, Self-Schemas and Psychological Flexibility

	CDSS	PSY	Malev.	Omnip.	Neg. self	VAAS
CDSS	-	.30*	.28	.24	.59***	-.31*
PSY		-	.63***	.45**	.50***	-.49**
Malev.			-	.74***	.57***	-.53***
Omnip.				-	.45**	-.58***
Neg. self					-	-.62***
VAAS						-

Note: CDSS = Calgary Depression Scale for Schizophrenia total score, PSY = Psychotic Symptoms Rating Scales – Auditory Hallucinations distress subscale score, Malev. = Beliefs About Voices Questionnaire-Revised malevolence subscale score, Omnip. = Beliefs About Voices Questionnaire-Revised omnipotence subscale score, Neg. Self = Brief Core Schema Scales negative self subscale score, VAAS = Voices Acceptance and Action Scale Section A.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Mediating Effect of Negative Self-Schemas

It was hypothesised that the relationship between malevolent appraisals of voices and voice-related distress is mediated by negative self-schemas. The indirect effect was not significant, $\beta = .04$, $SE = .03$, 95% CI = [-0.010, 0.091]. As this range contains zero, the hypothesis was not supported. When controlling for negative self-schemas, the direct effect of malevolent appraisals on voice-related distress reduced from $\beta = .20$, $SE = .04$, $t(43) = 5.30$, $p < .001$ to $\beta = .16$, $SE = .04$, $t(43) = 3.57$, $p < .001$. Malevolent appraisals significantly predicted negative self-schemas, $\beta = .75$, $SE = .17$, $t(43) = 4.52$, $p < .001$, however negative self-schemas did not significantly predict voice-related distress, $\beta = .05$, $SE = .03$, $t(43) = 1.46$, $p = .152$ (see Figure 1). The mediation model accounted for 43% of the variance in voice-related distress, $F(2, 41) = 15.51$, $p < .001$. Of this, 40% of the variance was accounted for by malevolent appraisals alone, $F(1, 42) = 28.12$, $p < .001$.

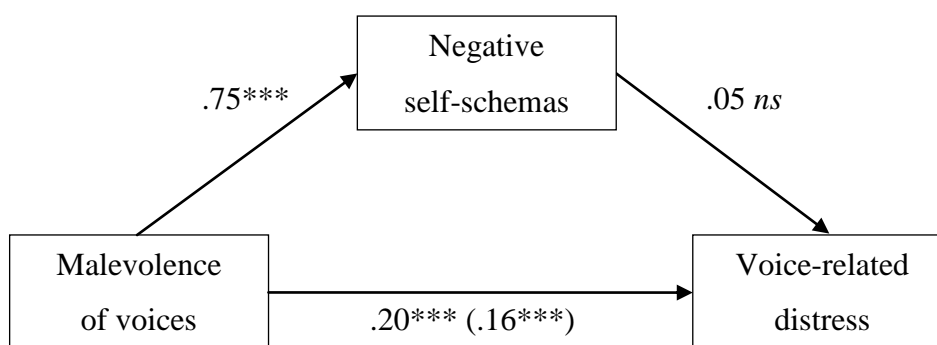


Figure 1. Beta coefficients for the relationship between malevolent appraisals and voice-related distress as mediated by negative self-schemas. The beta coefficient for the relationship between malevolent appraisals and voice-related distress, controlling for negative self-schemas, is in parenthesis.

*** $p < .001$, ns = non significant.

It was also hypothesised that the relationship between omnipotent appraisals of voices and voice-related distress is mediated by negative self-schemas. The indirect effect was significant, $\beta = .06$, $SE = .03$, 95% CI = [0.022, 0.132]. As this range does not contain zero, this hypothesis was supported. When controlling for negative self-schemas, the direct effect of omnipotent appraisals on voice-related distress reduced from $\beta = .17$, $SE = .05$, $t(43) = 3.25$, $p = .002$ to $\beta = .10$, $SE = .05$, $t(43) = 1.91$, $p = .063$. Omnipotent appraisals significantly predicted negative self-schemas, $\beta = .71$, $SE = .22$, $t(43) = 3.28$, $p = .002$, and negative self-schemas significantly predicted voice-related distress, $\beta = .09$, $SE = .03$, $t(43) = 2.61$, $p = .013$ (see Figure 2). The mediation model accounted for 31% of the variance in voice-related distress, $F(2, 41) = 9.41$, $p < .001$. Of this, 20% of the variance was accounted for by omnipotent appraisals alone, $F(1, 42) = 10.56$, $p = .002$).

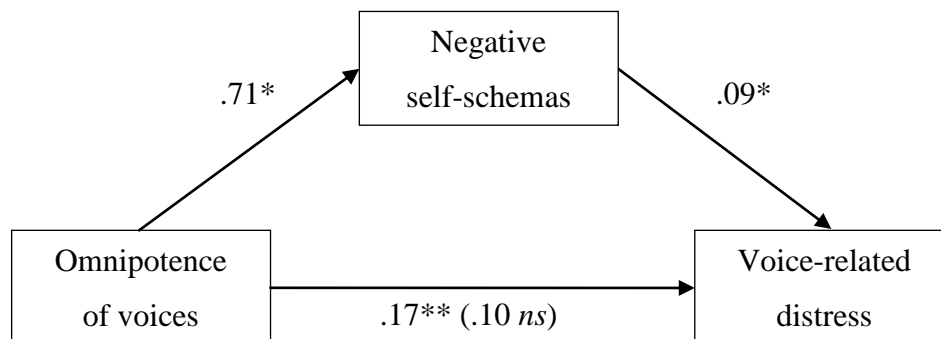


Figure 2. Beta coefficients for the relationship between omnipotent appraisals and voice-related distress as mediated by negative self-schemas. The beta coefficient for the relationship between omnipotent appraisals and voice-related distress, controlling for negative self-schemas, is in parenthesis.

* $p < .05$, ** $p < .01$, ns = non significant.

Moderating Effect of Psychological Flexibility

Psychological flexibility was examined as a moderator of the relationship between negative appraisals and voice-related distress (Figure 3).

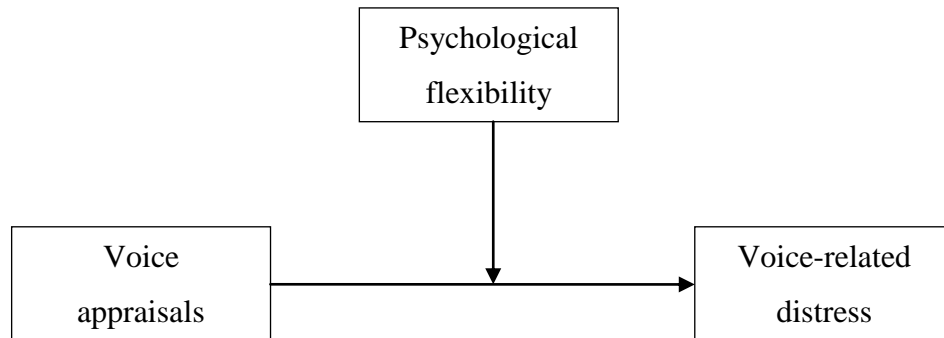


Figure 3. Diagrammatic representation of the proposed moderating effect of psychological flexibility on the relationship between malevolent voice appraisals and voice-related distress.

It was hypothesised that higher levels of psychological flexibility would weaken the relationship between malevolent voice appraisals and voice-related distress. The interaction effect of psychological flexibility and malevolent appraisals was significant, $\beta = .013$, 95% CI = [0.002, 0.024], $t = 2.38$, $p = .022$. The moderation model accounted for 51% of the variance in voice-related distress, $F(3,40) = 22.54$, $p < .001$. Simple slopes analysis was conducted (see Figure 4). When psychological flexibility scores were low (one standard deviation below the mean), there was no moderation effect, $\beta = .03$, 95% CI = [-0.162, 0.214], $t = 0.28$, $p = .781$. Mean scores on psychological flexibility produced a significant moderating effect, $\beta = .13$, 95% CI = [0.004, 0.247], $t = 2.08$, $p = .044$. This effect was highly significant at higher levels (one standard deviation above the mean) of psychological

flexibility, $\beta = .22$, 95% CI = [0.132, 0.317], $t = 4.92$, $p < .001$. Thus, psychological flexibility was a significant moderator of the relationship between malevolent appraisals and voice-related distress. Higher psychological flexibility weakened the relationship between malevolent appraisals and distress at low levels of malevolent appraisals.

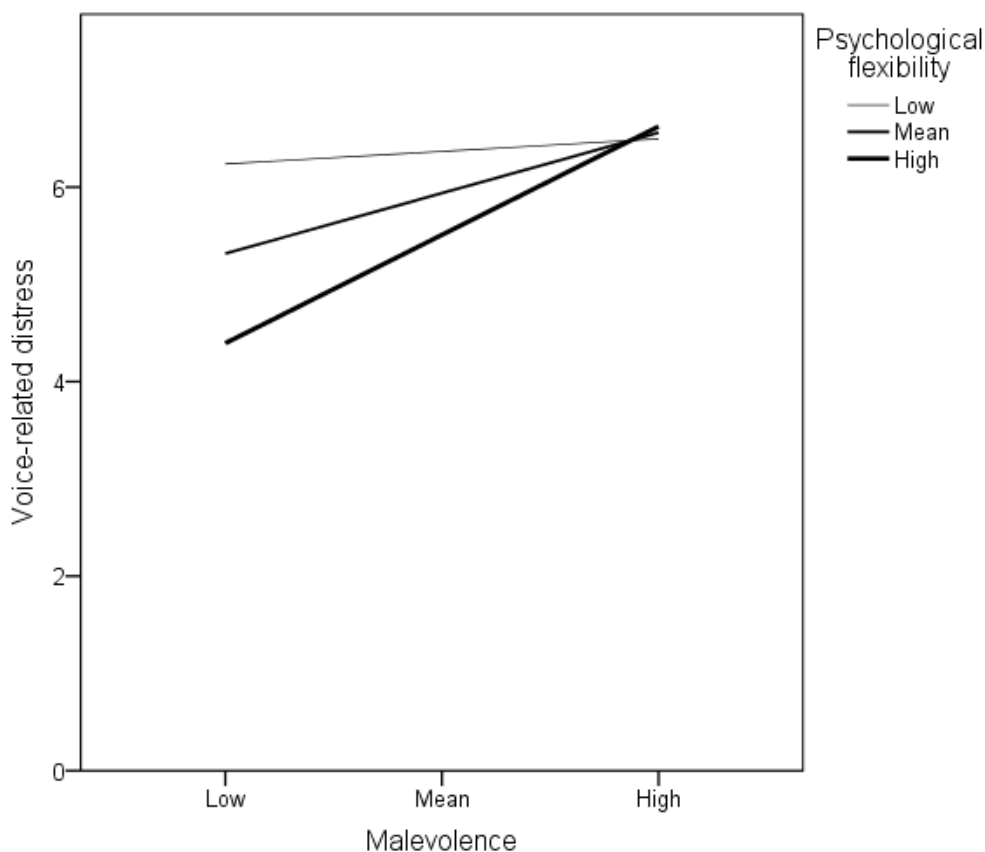


Figure 4. Moderating effect of psychological flexibility on the association between malevolent appraisals and voice-related distress at three different levels of the moderator. Low = one standard deviation below the mean, Mean = mean scores, High = one standard deviation above mean.

Psychological flexibility was also examined as a moderator of the relationship between omnipotent appraisals and voice-related distress. The

interaction effect of psychological flexibility and omnipotence was not significant, $\beta = .01$, 95% CI = [-0.002, 0.022], $t = 1.75$, $p = .088$. Thus, psychological flexibility did not significantly moderate the relationship between omnipotent appraisals and voice-related distress. Simple slopes analysis was conducted (see Figure 5). There was no moderating effect of psychological flexibility at one standard deviation below the mean, $\beta = -.01$, 95% CI = [-0.212, 0.194], $t = -0.09$, $p = .926$, or at mean levels of psychological flexibility, $\beta = .07$, 95% CI = [-0.083, 0.221], $t = 0.91$, $p = .366$. At high levels however, psychological flexibility significantly moderated the relationship between omnipotence and distress, $\beta = .15$, 95% CI = [0.001, 0.292], $t = 2.04$, $p = .048$. Higher psychological flexibility weakened the relationship between omnipotent appraisals and distress at low levels of omnipotent appraisals. This moderation model accounted for 32% of the variance in voice-related distress, $F(3,40) = 6.30$, $p = .001$.

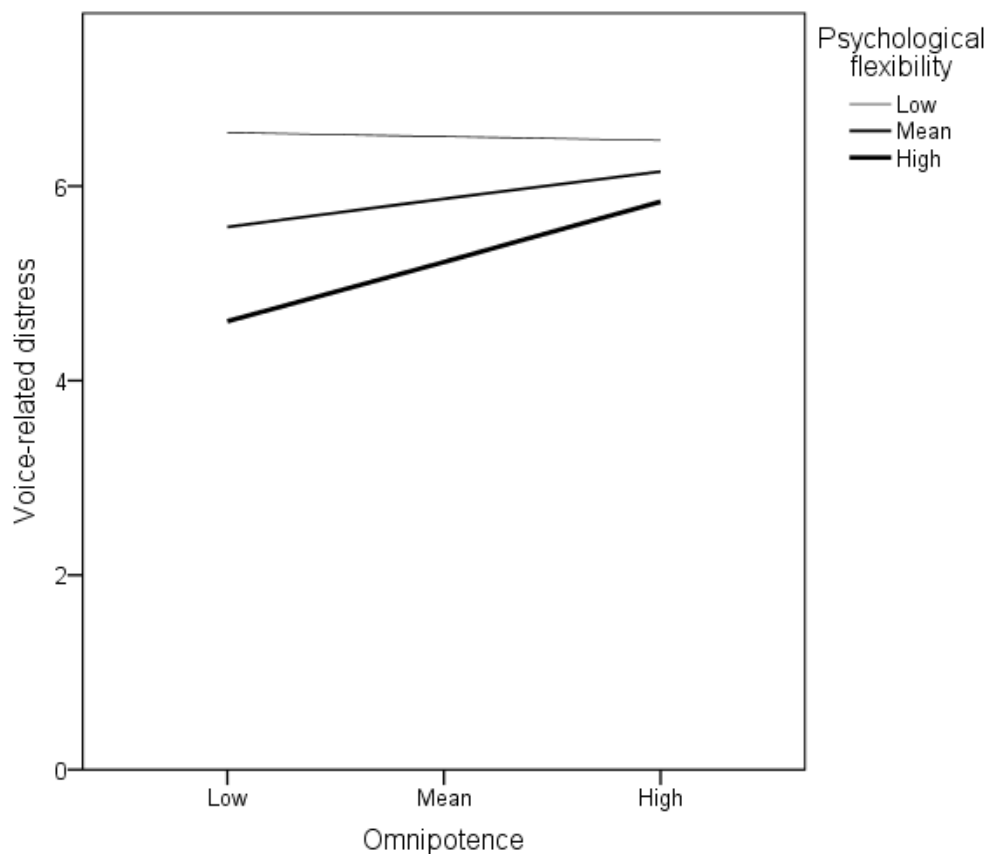


Figure 5. Moderating effect of psychological flexibility on the association between omnipotent appraisals and voice-related distress at three different levels of the moderator. Low = one standard deviation below the mean, Mean = mean scores, High = one standard deviation above mean.

Discussion

Appraisals of voice malevolence and omnipotence have consistently been found to predict distress, anxiety and depressed mood, independently of voice frequency and severity (Mawson et al., 2010). In contrast to previous research, no relationship was observed between malevolent or omnipotent voice appraisals and general depressive symptoms in this study. This disparity could be a result of different participant characteristics however the severity of symptoms, negative appraisals and distress in the present study was found to be comparable to that of

other studies (e.g. Trower et al., 2004). As such, it is likely that the discrepancy may be due to the different measures used to assess psychological distress.

Many previous studies have included measures of psychological distress which were not developed for use with individuals with psychotic symptoms, most commonly the Beck Depression Inventory (Beck et al, 1961) and the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983) to explore the relationship between negative voice appraisals and distress and did not report whether negative symptoms, which significantly overlap with depression, were controlled for (see Mawson et al, 2010). The CDSS is less confounded by positive and negative symptoms than other measures and may constitute a more reliable measure of low mood in individuals with psychotic symptoms. The present findings are consistent with Shawyer et al. (2007) who also found no relationship between malevolent and omnipotent appraisals and depression using the CDSS as the distress measure. Taken together, these results suggest that the impact of negative voice appraisals on overall mood may not be as significant as previously thought.

Additionally, depressed mood and distress specifically attributed to hallucinations as measured using the PSYRATS-AH distress items were only modestly correlated. Although speculative, given the chronic nature of participants' mental health difficulties, it is possible that other factors such as unemployment, lack of intimate relationships, socio-economic disadvantage and negative self-evaluative beliefs played a significant role in participants' mood, thereby weakening the role of distress related to hallucinations on overall mood.

The cognitive model of AVH (e.g. Chadwick & Birchwood, 1994) postulates that the beliefs an individual holds about their voices affects their emotional and

behavioural responses to their experiences. In line with previous research, results from this study support the link between the extent to which participants appraised their voices negatively and reported their hallucinations to be distressing. In their review of evidence for the cognitive model of AVH however, Mawson et al. (2010) noted that modifying cognitions of malevolence and omnipotence did not consistently reduce voice-related distress. They advocated the investigation of underlying variables which may mediate the association between voice appraisals and distress, and whether different mediators are implicated in different voice appraisals.

Social schemas, or the related construct of self-esteem, have been suggested as potential mediators of these relationships (Birchwood et al., 2000; 2004). In the present study, the mediating effect of negative self-schemas (e.g. “I am bad”, “I am worthless”) on the relationship between voice appraisals and voice-related distress was found to be dependent on the type of appraisal held. Voices perceived to be more powerful than the individual, for example “My voice makes me do things I really don’t want to do” and “My voice rules my life”, are associated with increased endorsement of negative self-schemas. In our mediation model, such self-schemas were in turn associated with greater distress. It is important to note that this study was cross-sectional therefore causality cannot be inferred. Paulik (2012) found that voice hearers who view themselves as inferior to others also feel inferior to their voices and advocated assertiveness and social skills training and self-esteem work to facilitate a more equal, and thus less distressing, relationship with their voice, in addition to altering distressing beliefs about voices. Results from the present study support this.

It was hypothesised that malevolent voices would strengthen participants' negative self-schemas which would in turn contribute to greater distress. This was not found to be the case. Although negative self-schemas were independently associated with malevolent appraisals and voice-related distress, they did not mediate the appraisal/voice-related distress relationship. The reasons for this are unclear. Smith et al. (2006) found that negative self-schemas and low self-esteem are associated with increased amount and intensity of negative voice content. It is possible that the presence of negative self-schemas contributes to negative content but that viewing hallucinations as malevolent allows individuals to attribute unpleasant content to the hostile and evil nature of the voice e.g. "My voice is evil", "My voice is persecuting me for no good reason", thereby avoiding further damage to self-esteem. This is speculative and further investigation is required to elucidate the links between negative self-schemas, content, malevolent appraisals and distress.

The secondary aim of the study was to explore the potential moderating effect of psychological flexibility on the relationship between malevolent and omnipotent appraisals and subsequent distress. To date, there has been little empirical investigation of the impact of psychological flexibility on voice-related distress (Mawson et al., 2010). Gaudiano et al. (2010) found that the extent to which participants took a detached, objective stance toward their experiences, subsequent to an ACT intervention, partially mediated the effect of treatment condition on voice-related distress, suggesting that increasing psychological flexibility could be a useful target of therapy.

In line with findings by Shawyer et al. (2007), in the current study psychological flexibility was found to be negatively correlated with depression.

Shawyer et al. (2007) also reported non-significant negative correlations between psychological flexibility and symptom severity, voice omnipotence and malevolence. In contrast, these correlations were highly significant in the present study. Both studies had a similar number of participants, inclusion criteria, duration of illness and mean level of psychological flexibility. In Shawyer et al.'s study, all participants experienced command hallucinations and mean scores for malevolent and omnipotent appraisals were not reported therefore direct comparisons cannot be made.

It was hypothesised that psychological flexibility, an individual's ability to view internal experiences such as hallucinations from an objective, detached stance and take goal directed action even in the presence of these experiences, would offset the impact of negative appraisals on voice-related distress. Psychological flexibility significantly moderated the relationship between malevolent appraisals and voice-related distress. As expected, low levels of psychological flexibility had no impact, whereas the effect strengthened as psychological flexibility increased. Specifically, high psychological flexibility was associated with reduced distress when beliefs of voice malevolence were less strongly held. When individuals perceived their voices to be highly malevolent, psychological flexibility did not affect the extent to which they were distressed by their voices. When negative appraisals were less strongly held however, individuals with a high degree of psychological flexibility were less distressed by their voices than those with low or average levels of psychological flexibility. As psychological flexibility involves viewing all internal experiences in an objective way and continuing to work toward valued goals, it was expected that it would moderate the relationship of both malevolent and omnipotent appraisals in a

similar fashion. Psychological flexibility did not moderate the effect of omnipotent appraisals on voice-related distress overall. However, as with the malevolent appraisal/distress relationship, a high level of psychological flexibility was associated with less distress when omnipotent appraisals were less strongly held.

These results provide support for the use of techniques aiming to increase an objective stance towards distressing hallucinations such as ACT and other mindfulness-oriented psychotherapies. However, given that high psychological flexibility was only associated with reduced distress when negative appraisals were weak, it may be most beneficial to incorporate techniques designed to increase psychological flexibility with techniques which directly modify negative appraisals such as behavioural experiments, positive data logs and verbal reattribution. Such strategies are often seen as at odds with approaches such as ACT; however, if the emphasis in delivery of the strategies remains on the finding of workable strategies for living well with unusual experiences, these strategies need not be incompatible. Emphasising active, exposure-based reattribution strategies may ensure that these strategies are compatible with an acceptance and mindfulness-based approach. Despite this potential theoretical tension, the current study's results do suggest that targeting attributions about voices could be a useful compliment to an ACT approach. Future clinical case series could be useful in determining the optimum sequencing of these different strategies.

Strengths and Limitations of the Study

To the author's knowledge, no specific measure of voice-related distress has been developed and validated. To ensure that psychological distress was adequately and accurately measured, both a general measure of depressive symptoms for

individuals with schizophrenia and a subscale of a widely-used and well-validated measure (PSYRATS-AH) were used. This subscale has not been rigorously validated as a standalone scale however the items have face validity and individual items on the PSYRATS-AH have been used by other researchers to measure voice-related distress (e.g. Shawyer et al., 2012; Smith et al, 2006, Trower et al, 2004)

Although the sample size in the present study is comparable to other published studies involving participants who experience AVH, the study was underpowered. Therefore there is an increased risk of type II error. Notably, the overall moderating effect of psychological flexibility on the relationship between omnipotent voices and distress was marginally above significance at the .05 level. Simple slopes analyses revealed an association between high psychological flexibility and lower distress at low levels of omnipotent appraisals. This follows the pattern of the moderation effect of psychological flexibility on distress due to malevolent appraisals and warrants further investigation using a larger sample.

Conversely, due to the small sample, there is also increased potential for type I error i.e. the direct and indirect effects observed in this study may be overinflated due to the restricted variance of a smaller sample and the results may not generalise to other samples. Almost all participants in this study identified as White British or White Scottish. As such, the results may not be generalisable to other populations. Nevertheless, this study included participants from both outpatient and inpatient mental health services, with varying severity and duration of illness. As such, it may be considered representative of the patients clinicians are likely to see in UK practice. The transdiagnostic nature of the study is in line with the complaint-orientated approach to psychopathology, which attempts to understand the aetiology

and maintaining factors of individual symptoms, rather than specific diagnostic classifications (Bentall, 2003).

The relatively small sample size was the result of recruitment difficulties. Woodall et al. (2010) identified broad ranging barriers to participation in mental health research including fear, suspicion or distrust of researchers, concerns about confidentiality, transportation difficulties, severity of illness, lack of financial reward, inconvenience, fear of relapse as a result of participation and the stigma of mental illness. Many of these barriers are of particular relevance to individuals with psychosis. Efforts were made to minimize these barriers such as offering home visits, suggesting that a family member or keyworker could be present during participation and providing both written and verbal explanations about confidentiality. Individuals were not required to provide reasons for declining to participate however, where reasons were spontaneously offered, anxiety, fear of relapse and reluctance to meet another mental health professional in addition to their team were commonly identified.

Clinical Implications and Future Research

The impact of both negative self-schemas and psychological flexibility on distress was found to depend on the type of negative appraisals held, highlighting the importance of a full assessment of an individual's beliefs about their voices when considering treatment options. For example, patients who experience AVH as omnipotent may benefit from assertiveness training and self-esteem work whereas those who view their voices as primarily malevolent may be better served by focussing on altering these appraisals while also facilitating increased psychological flexibility. Further research is needed to investigate whether the results obtained in

the present study can be replicated. In particular, it would be useful to assess the potential moderating effect of psychological flexibility on the relationship between omnipotent appraisals and voice-related distress using a larger sample. Within the study, duration of voice hearing varied from under a year to 36 years. Future research may explore whether the effects of negative self-schemas and psychological flexibility on voice-related distress change over time i.e. whether individuals who have experienced AVH for many years respond differently than those who have only recently begun to hear voices.

Finally, the results of the present study provide further support for the significant role psychosocial factors such as cognitive appraisals, self-schemas and psychological flexibility play in voice-related distress. Experimental studies are needed to ascertain whether the results in this study translate to meaningful and useful targets for psychological therapy with individuals who experience distressing hallucinations.

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THESIS APPENDICES

Appendix A: Clinical Psychology Review - Guide for Authors



Preparation

Use of word processing software

It is important that the file be saved in the native format of the word processor used. The text should be in single-column format. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. In particular, do not use the word processor's options to justify text or to hyphenate words. However, do use bold face, italics, subscripts, superscripts etc. When preparing tables, if you are using a table grid, use only one grid for each individual table and not a grid for each row. If no grid is used, use tabs, not spaces, to align columns. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the Guide to Publishing with Elsevier: <http://www.elsevier.com/guidepublication>). Note that source files of figures, tables and text graphics will be required whether or not you embed your figures in the text. See also the section on Electronic artwork.

To avoid unnecessary errors you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

Article structure

Manuscripts should be prepared according to the guidelines set forth in the Publication Manual of the American Psychological Association (6th ed., 2009). Of note, section headings should not be numbered.

Manuscripts should ordinarily not exceed 50 pages, *including* references and tabular material. Exceptions may be made with prior approval of the Editor in Chief. Manuscript length can often be managed through the judicious use of appendices. In general the References section should be limited to citations actually discussed in the text. References to articles solely included in meta-analyses should be included in an appendix, which will appear in the on line version of the paper but not in the print copy. Similarly, extensive Tables describing study characteristics, containing material published elsewhere, or presenting formulas and other technical material should also be included in an appendix. Authors can direct readers to the appendices in appropriate places in the text.

It is authors' responsibility to ensure their reviews are comprehensive and as up to date as possible (at least through the prior calendar year) so the data are still current at the time of publication. Authors are referred to the PRISMA Guidelines (<http://www.prisma-statement.org/statement.htm>) for guidance in conducting reviews and preparing manuscripts. Adherence to the Guidelines is not required, but is recommended to enhance quality of submissions and impact of published papers on the field.

Appendices

If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

Essential title page information

Title. Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible. **Note: The title page should be the first page of the manuscript document indicating the author's names and affiliations and the corresponding author's complete contact information.**

Author names and affiliations. Where the family name may be ambiguous (e.g., a double name), please indicate this clearly. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name, and, if available, the e-mail address of each author within the cover letter.

Corresponding author. Clearly indicate who is willing to handle correspondence at all stages of refereeing and publication, also post-publication. **Ensure that telephone and fax numbers (with country and area code) are provided in addition to the e-mail address and the complete postal address.**

Present/permanent address. If an author has moved since the work described in the article was done, or was visiting at the time, a "Present address" (or "Permanent address") may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

Abstract

A concise and factual abstract is required (not exceeding 200 words). This should be typed on a separate page following the title page. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separate from the article, so it must be able to stand alone. References should therefore be avoided, but if essential, they must be cited in full, without reference to the reference list.

Graphical abstract

A Graphical abstract is optional and should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership online. Authors must provide images that clearly represent the work described in the article. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: Please provide an image with a minimum of 531 × 1328 pixels (h × w) or proportionally more. The image should be readable at a size of 5 × 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files. See <http://www.elsevier.com/graphicalabstracts> for examples.

Authors can make use of Elsevier's Illustration and Enhancement service to ensure the best presentation of their images also in accordance with all technical requirements: [Illustration Service](#).

Highlights

Highlights are mandatory for this journal. They consist of a short collection of bullet points that convey the core findings of the article and should be submitted in a separate file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point). See <http://www.elsevier.com/highlights> for examples.

Keywords

Immediately after the abstract, provide a maximum of 6 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

Abbreviations

Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

Footnotes

Footnotes should be used sparingly. Number them consecutively throughout the article, using superscript Arabic numerals. Many wordprocessors build footnotes into the text, and this feature may be used. Should this not be the case, indicate the position of footnotes in the text and present the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list.

Table footnotes

Indicate each footnote in a table with a superscript lowercase letter.

Electronic artwork

General points

- Make sure you use uniform lettering and sizing of your original artwork.
- Embed the used fonts if the application provides that option.
- Aim to use the following fonts in your illustrations: Arial, Courier, Times New Roman, Symbol, or use fonts that look similar.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Provide captions to illustrations separately.
- Size the illustrations close to the desired dimensions of the printed version.
- Submit each illustration as a separate file.

A detailed guide on electronic artwork is available on our website:

<http://www.elsevier.com/artworkinstructions>

You are urged to visit this site; some excerpts from the detailed information are given here.

Formats

If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply 'as is' in the native document format.

Regardless of the application used other than Microsoft Office, when your electronic artwork is finalized, please 'Save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):

EPS (or PDF): Vector drawings, embed all used fonts.

TIFF (or JPEG): Color or grayscale photographs (halftones), keep to a minimum of 300 dpi.

TIFF (or JPEG): Bitmapped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi.

TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale), keep to a minimum of 500 dpi.

Please do not:

- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have a low number of pixels and limited set of colors;
- Supply files that are too low in resolution;
- Submit graphics that are disproportionately large for the content.

Color artwork

Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF), or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color on the Web (e.g., ScienceDirect and other sites) regardless of whether or not these illustrations are reproduced in color in the printed version. **For color reproduction in print, you will receive**

information regarding the costs from Elsevier after receipt of your accepted article. Please indicate your preference for color: in print or on the Web only. For further information on the preparation of electronic artwork, please see <http://www.elsevier.com/artworkinstructions>.

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Figure captions

Ensure that each illustration has a caption. Supply captions separately, not attached to the figure. A caption should comprise a brief title (**not** on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

Tables

Number tables consecutively in accordance with their appearance in the text. Place footnotes to tables below the table body and indicate them with superscript lowercase letters. Avoid vertical rules. Be sparing in the use of tables and ensure that the data presented in tables do not duplicate results described elsewhere in the article.

References

Citations in the text should follow the referencing style used by the American Psychological Association. You are referred to the Publication Manual of the American Psychological Association, Sixth Edition, ISBN 1-4338-0559-6, copies of which may be ordered from <http://books.apa.org/books.cfm?id=4200067> or APA Order Dept., P.O.B. 2710, Hyattsville, MD 20784,

USA or APA, 3 Henrietta Street, London, WC3E 8LU, UK. Details concerning this referencing style can also be found at <http://humanities.byu.edu/linguistics/Henrichsen/APA/APA01.html>

Citation in text

Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

Web references

As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.

References in a special issue

Please ensure that the words 'this issue' are added to any references in the list (and any citations in the text) to other articles in the same Special Issue.

Reference management software

This journal has standard templates available in key reference management packages EndNote (<http://www.endnote.com/support/enstyles.asp>) and Reference Manager (<http://refman.com/support/rmstyles.asp>). Using plug-ins to wordprocessing packages, authors only need to select the appropriate journal template when preparing their article and the list of references and citations to these will be formatted according to the journal style which is described below.

Reference style

References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters "a", "b", "c", etc., placed after the year of publication. **References should be formatted with a hanging indent (i.e., the first line of each reference is flush left while the subsequent lines are indented).**

Examples: Reference to a journal publication: Van der Geer, J., Hanraads, J. A. J., & Lupton R. A. (2000). The art of writing a scientific article. *Journal of Scientific Communications*, 163, 51-59.

Reference to a book: Strunk, W., Jr., & White, E. B. (1979). *The elements of style*. (3rd ed.). New York: Macmillan, (Chapter 4).

Reference to a chapter in an edited book: Mettam, G. R., & Adams, L. B. (1994). How to prepare an electronic version of your article. In B.S. Jones, & R. Z. Smith (Eds.), *Introduction to the electronic age* (pp. 281-304). New York: E-Publishing Inc.

Appendix B: Controlled Study Checklist

Study:			
No	Criterion	In this study, this criterion is:	
1	The assignment of participants to treatment groups is randomised	Randomisation is clearly described using an appropriate method	Well covered (2)
		It is stated that randomisation is carried out, but no explanation of method is given or using inappropriate method is used (alternate allocation, allocation by date of birth, or day of the week attending a clinic)	Poorly addressed (1)
		Randomisation was not carried out or described	Not addressed/reported/applicable (0)
2	Raters are blind to the intervention type	Raters are blind throughout the intervention and follow-up	Well covered (3)
		Raters were partially blind (eg at assessment only)	Adequately covered (2)
		Blind rating was mentioned but not carried out	Poorly addressed (1)
		No reference to blind rating	Not addressed/reported/applicable (0)
3	The treatment groups are similar at the start of the trial; baseline scores described and differences assessed	Clear details of baseline characteristics between groups. No difference between groups or differences controlled for	Well covered (3)
		Reasonable detail of baseline characteristics between groups, and reasonably similar at baseline	Adequately covered (2)
		Baseline characteristics assessed but limited description provided or groups different at baseline and not controlled for	Poorly addressed (1)
		Baseline characteristics not assessed or not reported	Not addressed/reported/applicable (0)
4	The only difference between groups is the treatment under investigation	Detailed consideration has been to this point and it is clear that the treatment is the only difference between groups	Well covered (3)
		Some consideration has been to this point and it is likely that the treatment is the only difference between groups	Adequately covered (2)
		Consideration has been given to this point but limited description given and it is unclear whether the treatment was the only difference between groups	Poorly addressed (1)
		No consideration has been given to this point	Not addressed/reported/applicable (0)

5	The trial demonstrates external validity; evaluating the intervention within a clinically relevant setting and for an appropriate duration	The intervention is conducted within a clinically relevant setting and for the recommended duration	Well covered (3)
		The intervention is conducted within a clinically relevant setting and for an adequate duration	Adequately covered (2)
		The intervention is not conducted within a clinically relevant setting or is not conducted for an adequate duration	Poorly addressed (1)
		The intervention is not conducted within a clinically relevant setting and is not conducted for an adequate duration	Not addressed/reported/applicable (0)
6	The intervention is both sufficiently defined and delivered as planned; good fidelity evidenced in the form of describing staff training, checking adherence to treatment manual/protocol	The intervention is clearly outlined and shows good treatment fidelity – could be replicated	Well covered (3)
		Some detail about the intervention, alteration of intervention from its original form is well described	Adequately covered (2)
		Unclear definition of the intervention and its fidelity	Poorly addressed (1)
		No information provided regarding treatment fidelity	Not addressed/reported/applicable (0)
7	Number of participants approached to participate and levels of attrition are reported	Levels of attrition (from allocation to group to completion of post intervention measures) are clearly detailed for both treatment and control groups and are sufficiently alike between conditions (within 10% of each other and less than 20% of total participants)	Well covered (3)
		Reasonable description of attrition (from allocation to group to completion of post intervention measures), somewhat alike between conditions (within 20% of each other, less than 30% of total participants)	Adequately covered (2)
		Poorly described or significantly different between conditions	Poorly addressed (1)
		Not described	Not addressed/reported/applicable (0)
8	A power calculation is reported and sufficient power is achieved	Power calculation is reported and sufficient power is achieved	Well covered (3)
		Power calculation is not reported but study is likely to have sufficient power due to large sample size	Adequately covered (2)
		Power calculation is reported and study lacks statistical power at least at one time point	Poorly addressed (1)
		Power calculation is not reported and study may lack statistical power	Not addressed/reported/applicable (0)

9	Hallucination measures are evidenced to be both valid and reliable	Standardised measures of hallucinations used. Measures are well validated and reliable and cover more than one aspect of hallucinations. All measures have evidence of good validity and reliability	Well covered (3)
		Standardised measures of hallucinations used. Measures are well validated and reliable and cover one aspect of hallucinations. At least 50% of these measures have evidence of good validity and reliability	Adequately covered (2)
		Non-standardised measures of hallucinations used or measures of hallucinations that are not well validated and reliable were used. Less than 50% of the measures have evidence of good validity or reliability	Poorly addressed (1)
		No measure of hallucinations used	Not addressed/reported/applicable (0)
10	Additional outcome measures are evidenced to be both valid and reliable	Standardised measures used. All measures have evidence of good validity and reliability	Well covered (3)
		Standardised measures used. At least 50% of these measures have evidence of good validity and reliability.	Adequately covered (2)
		Non-standardised measures or measures that are not well validated and reliable were used. Less than 50% of the measures have evidence of good validity or reliability	Poorly addressed (1)
		No additional measures used	Not addressed/reported/applicable (0)
11	Intention to treat analyses are reported and missing values are imputed	Intention-to-treat analyses are well described and all subjects analysed in their appropriate group	Well covered (3)
		Intention-to-treat analyses was mentioned but not described in any detail	Adequately covered (2)
		It was not clear if intention-to-treat analyses was used	Poorly addressed (1)
		No intention-to-treat analysis was used	Not addressed/reported/applicable (0)
12	Effect sizes reported for hallucination measures	Effect sizes reported for all tests or could be calculated from data presented	Well covered (3)
		Effect sizes reported for at least 50% of the tests or could be calculated from data presented	Adequately covered (2)
		Effect sizes reported for less than 50% of the tests	Poorly addressed (1)
		Effect sizes not reported and data not sufficient to be calculated	Not addressed/reported/applicable (0)
13	The intervention is evaluated for an appropriate duration	Follow-up carried out for a minimum of 3 months (must include hallucination measure)	Well covered (3)
		Follow-up carried out for a minimum of 1 month (must include hallucination measure)	Adequately covered (2)
		Follow-up less than one month	Poorly addressed (1)
		No follow-up	Not addressed/reported/applicable (0)

Appendix C: Case Series and Case Study Checklist

Study:			
No	Criterion	In this study, this criterion is:	
1	Baseline scores and demographic information described	Clear details of demographics and baseline characteristics	Well covered (3)
		Reasonable detail of demographics and baseline characteristics	Adequately covered (2)
		Baseline characteristics assessed but limited description provided	Poorly addressed (1)
		Baseline characteristics not assessed or not reported	Not addressed/reported/applicable (0)
2	The trial demonstrates external validity; evaluating the intervention within a clinically relevant setting and for an appropriate duration	The intervention is conducted within a clinically relevant setting and for the recommended duration	Well covered (3)
		The intervention is conducted within a clinically relevant setting and for an adequate duration	Adequately covered (2)
		The intervention is not conducted within a clinically relevant setting or is not conducted for an adequate duration	Poorly addressed (1)
		The intervention is not conducted within a clinically relevant setting and is not conducted for an adequate duration	Not addressed/reported/applicable (0)
3	Raters are blind to the intervention type	Raters are blind throughout the intervention and follow-up	Well covered (3)
		Raters were partially blind (eg at assessment only)	Adequately covered (2)
		Blind rating was mentioned but not carried out	Poorly addressed (1)
		No reference to blind rating	Not addressed/reported/applicable (0)
4	The intervention is both sufficiently defined and delivered as planned; good fidelity evidenced in the form of describing staff training, checking adherence to treatment manual/protocol	The intervention is clearly outlined and shows good treatment fidelity – could be replicated	Well covered (3)
		Some detail about the intervention, alteration of intervention is well described but insufficient evidence of treatment fidelity and staff training	Adequately covered (2)
		Unclear definition of the intervention and its fidelity	Poorly addressed (1)
		No information provided regarding treatment fidelity	Not addressed/reported/applicable (0)

5	Hallucination measures are evidenced to be both valid and reliable	Standardised measures of hallucinations used. Measures are well validated and reliable and cover more than one aspect of hallucinations. All measures have evidence of good validity and reliability	Well covered (3)
		Standardised measures of hallucinations used. Measures are well validated and reliable and cover one aspect of hallucinations. At least 50% of these measures have evidence of good validity and reliability	Adequately covered (2)
		Non-standardised measures of hallucinations used or measures of hallucinations that are not well validated and reliable were used. Less than 50% of the measures have evidence of good validity or reliability	Poorly addressed (1)
		No measure of hallucinations used	Not addressed/reported/applicable (0)
6	Additional outcome measures are evidenced to be both valid and reliable	Standardised measures used. All measures have evidence of good validity and reliability	Well covered (3)
		Standardised measures used. At least 50% of these measures have evidence of good validity and reliability.	Adequately covered (2)
		Non-standardised measures or measures that are not well validated and reliable were used. Less than 50% of the measures have evidence of good validity or reliability	Poorly addressed (1)
		No additional measures used	Not addressed/reported/applicable (0)
7	Effect sizes reported for hallucination measures	Effect sizes reported for all tests or could be calculated from data presented	Well covered (3)
		Effect sizes reported for at least 50% of the tests or could be calculated from data presented	Adequately covered (2)
		Effect sizes reported for less than 50% of the tests	Poorly addressed (1)
		Effect sizes not reported and data not sufficient to be calculated	Not addressed/reported/applicable (0)
8	The intervention is evaluated for an appropriate duration	Follow-up carried out for a minimum of 3 months (must include hallucination measure)	Well covered (3)
		Follow-up carried out for a minimum of 1 month (must include hallucination measure)	Adequately covered (2)
		Follow-up less than one month	Poorly addressed (1)
		No follow-up	Not addressed/reported/applicable (0)

Appendix D: Classifications for Overall Study Quality and Risk of Bias

Rating	Description
Excellent	More than 85% of the criteria have been well covered. Limitations of the study are thought to be very unlikely to have affected the findings or conclusions.
Very Good	Between 70% and 85% of the criteria have been well covered or adequately addressed. Limitations of the study are thought to be unlikely to have affected the findings or conclusions.
Reasonable	Between 55% and 70% of the criteria have been well covered or adequately addressed. Limitations of the study may have modestly affected the findings or conclusions.
Limited	Less than 55% of the criteria have been well covered or adequately addressed. Limitations of the study are thought to be likely or very likely to have affected the findings or conclusions.

Appendix E: Quality Ratings for Controlled Studies

Study/Quality criterion	Langer et al. (2010) Spain	Chadwick et al. (2009) UK	Gaudiano & Herbert (2006) USA	Bach & Hayes (2002) USA
Randomisation	1	1	3	1
Blind rating	0	0	1	1
Similar at baseline	1	1	3	3
Difference between groups	2	1	2	2
Clinically relevant	1	2	1	3
Treatment fidelity	2	2	2	2
Attrition levels	1	3	3	1
Power calculation	0	0	0	0
Hallucination measure	1	3	1	1
Other measures	0	3	3	1
Intention-to-Treat	0	0	3	0
Effect sizes	3	3	3	0
Follow-up	3	0	0	0
Overall classification (Total)	Limited (15)	Limited (19)	Reasonable (24)	Limited (16)

Note: 3 = Well covered, 2 = Adequately covered, 1 = Poorly addressed, 0 = Not addressed.

Appendix F: Quality Ratings for Case Series and Case Studies

Study/Quality criterion	Gaudiano et al. (2013) USA	Newman Taylor et al. (2009) UK	Mayhew & Gilbert (2008) UK	Viega-Martínez et al. (2008) Spain	Pankey & Hayes (F) USA
Demographics	3	2	2	2	2
Clinically relevant	3	3	3	3	2
Blind rating	0	0	0	0	0
Treatment fidelity	2	2	2	2	2
Hallucination measures	2	1	3	1	1
Other measures	3	0	2	1	1
Effect size	3	1	1	0	0
Follow-up	3	2	3	0	2
Overall classification (Total)	Excellent (19)	Limited (11)	Very Good (16)	9 (Limited)	10 (Limited)

Note: 3 = Well covered, 2 = Adequately covered, 1 = Poorly addressed, 0 = Not addressed.

Appendix G: Behaviour Research and Therapy – Guide for Authors



Preparation

Article structure

Subdivision - unnumbered sections

Divide your article into clearly defined sections. Each subsection is given a brief heading. Each heading should appear on its own separate line. Subsections should be used as much as possible when cross-referencing text: refer to the subsection by heading as opposed to simply 'the text'.

Appendices

If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

Essential title page information

- **Title.** Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.
- **Author names and affiliations.** Where the family name may be ambiguous (e.g., a double name), please indicate this clearly. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.
- **Corresponding author.** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. **Ensure that phone numbers (with country and area code) are provided in addition to the e-mail address and the complete postal address. Contact details must be kept up to date by the corresponding author.**
- **Present/permanent address.** If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

Abstract

A concise and factual abstract is required with a maximum length of 200 words. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

Graphical abstract

A Graphical abstract is optional and should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership online. Authors must provide images that clearly represent the work described in the article. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: Please provide an image with a minimum of 531 × 1328 pixels (h × w) or proportionally more. The image should be readable at a size of 5 × 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files.

See <http://www.elsevier.com/graphicalabstracts> for examples.

Authors can make use of Elsevier's Illustration and Enhancement service to ensure the best presentation of their images also in accordance with all technical requirements: [Illustration Service](#).

Highlights

Highlights are mandatory for this journal. They consist of a short collection of bullet points that convey the core findings of the article and should be submitted in a separate file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point). See <http://www.elsevier.com/highlights> for examples.

Keywords

Immediately after the abstract, provide a maximum of 6 keywords, to be chosen from the APA list of index descriptors. These keywords will be used for indexing purposes. **Abbreviations**

Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

Shorter communications

This option is designed to allow publication of research reports that are not suitable for publication as regular articles. Shorter Communications are appropriate for articles with a specialized focus or of particular didactic value. Manuscripts should be between 3000-5000 words, and must not exceed the upper word limit. This limit includes the abstract, text, and references, but not the title page, tables and figures.

Artwork

Electronic artwork

General points

- Make sure you use uniform lettering and sizing of your original artwork.
- Embed the used fonts if the application provides that option.
- Aim to use the following fonts in your illustrations: Arial, Courier, Times New Roman, Symbol, or use fonts that look similar.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Provide captions to illustrations separately.
- Size the illustrations close to the desired dimensions of the printed version.
- Submit each illustration as a separate file.

A detailed guide on electronic artwork is available on our website:

<http://www.elsevier.com/artworkinstructions>

You are urged to visit this site; some excerpts from the detailed information are given here.

Formats

If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply 'as is' in the native document format.

Regardless of the application used other than Microsoft Office, when your electronic artwork is finalized, please 'Save as' or convert the images to one of the following formats (note the resolution

requirements for line drawings, halftones, and line/halftone combinations given below):

EPS (or PDF): Vector drawings, embed all used fonts.

TIFF (or JPEG): Color or grayscale photographs (halftones), keep to a minimum of 300 dpi.

TIFF (or JPEG): Bitmapped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi.

TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale), keep to a minimum of 500 dpi.

Please do not:

- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have a low number of pixels and limited set of colors;
- Supply files that are too low in resolution;
- Submit graphics that are disproportionately large for the content.

Tables

Number tables consecutively in accordance with their appearance in the text. Place footnotes to tables below the table body and indicate them with superscript lowercase letters. Avoid vertical rules. Be sparing in the use of tables and ensure that the data presented in tables do not duplicate results described elsewhere in the article.

References

Citation in text

Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

Web references

As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.

Reference management software

This journal has standard templates available in key reference management packages EndNote (<http://www.endnote.com/support/enstyles.asp>) and Reference Manager (<http://refman.com/support/rmstyles.asp>). Using plug-ins to wordprocessing packages, authors only need to select the appropriate journal template when preparing their article and the list of references and citations to these will be formatted according to the journal style which is described below.

Reference style

Text: Citations in the text should follow the referencing style used by the American Psychological Association. You are referred to the Publication Manual of the American Psychological Association, Sixth Edition, ISBN 978-1-4338-0561-5, copies of which may be ordered from <http://books.apa.org/books.cfm?id=4200067> or APA Order Dept., P.O.B. 2710, Hyattsville, MD 20784, USA or APA, 3 Henrietta Street, London, WC3E 8LU, UK.

List: references should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters 'a', 'b', 'c', etc., placed after the year of publication.

Examples:

Reference to a journal publication:

Van der Geer, J., Hanraads, J. A. J., & Lupton, R. A. (2010). The art of writing a scientific article. *Journal of Scientific Communications*, 163, 51–59.

Reference to a book:

Strunk, W., Jr., & White, E. B. (2000). *The elements of style*. (4th ed.). New York: Longman, (Chapter 4).

Reference to a chapter in an edited book:

Mettam, G. R., & Adams, L. B. (2009). How to prepare an electronic version of your article. In B. S. Jones, & R. Z. Smith (Eds.), *Introduction to the electronic age* (pp. 281–304). New York: E-Publishing Inc.

Appendix H: Letter of Ethical Approval

EoSRES



Research Ethics Service

East of Scotland Research Ethics Service (EoSRES) REC 2

(formerly Tayside Fife & Forth Valley REC)
Tayside Medical Sciences Centre (TASC)
Residency Block C, Level 3
Ninewells Hospital & Medical School
George Pirie Way
Dundee DD19SY

Ms Lauren Quigley
Trainee Clinical Psychologist
NHS Tayside
Tayside Area Psychological Therapies Service
7 Dudhope Terrace
Dundee
DD3 6HG

Date: 07 August 2013
Your Ref:
Our Ref: LR/13/ES/0080
Enquiries to: Mrs Lorraine Reilly
Direct Line: 01382 383878
Email: eosres.tayside@nhs.net

Dear Ms Quigley

Study title: Psychological flexibility and negative self-concept as mediators of psychological distress due to malevolent and omnipotent voices
REC reference: 13/ES/0080
IRAS project ID: 127614

Thank you for your letter of 05 August 2013, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Vice-Chair.

We plan to publish your research summary wording for the above study on the NRES website, together with your contact details, unless you expressly withhold permission to do so. Publication will be no earlier than three months from the date of this favourable opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to withhold permission to publish, please contact the Co-ordinator Mrs Lorraine Reilly, lorraine.reilly@nhs.net.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

- The Participant Information Sheet under 'Who has reviewed this study' should be the East of Scotland Research Ethics Committee REC 2 and not REC 1 as incorrectly inserted into the Provisional Opinion letter. I would be grateful if you could send a revised copy with new version number and full date for our records.

Ethical review of research sites



NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Non-NHS sites

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission ("R&D approval") should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at <http://www.rdforum.nhs.uk>.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Evidence of insurance or indemnity		17 July 2012
Evidence of insurance or indemnity		
GP/Consultant Information Sheets	1	03 June 2013
Investigator CV		27 May 2013
Other: CV - Dr David Gillanders		15 May 2013
Other: CV - Professor Kevin Power		
Other: CV - Dr Claire Campbell		
Other: Email covering letter		05 August 2013
Other: GCP Certificate Claire Campbell		25 July 2013
Other: GCP Certificate Lauren Quigley		19 July 2013
Participant Consent Form	1	27 April 2013
Participant Consent Form	2	16 July 2013
Participant Information Sheet	1	27 April 2013
Participant Information Sheet	2	16 July 2013
Protocol	1	27 April 2013



Questionnaire: VAAS		
Questionnaire: BAVQ-R		
Questionnaire: Brief Core Schema Scales		
Questionnaire: PSYRATS		
Questionnaire: Calgary Depression Scale for Schizophrenia		
Questionnaire: Demographic Information	1	27 April 2013
REC application	127614/465339/1/819	17 June 2013
Response to Request for Further Information		05 August 2013
Summary/Synopsis	1	28 March 2013
Summary/Synopsis	1	28 March 2013

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document "*After ethical review – guidance for researchers*" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

Further information is available at National Research Ethics Service website > After Review



13/ES/0080:*Please quote this number on all correspondence*

We are pleased to welcome researchers and R & D staff at our NRES committee members' training days – see details at <http://www.hra.nhs.uk/hra-training/>

Yours sincerely



pp for
Dr Anthony Davis
Vice-chair

eosres.tayside@nhs.net

Enclosures: "After ethical review – guidance for researchers"

Copy to: Miss Marianne Laird
NHS Tayside R&D office



Appendix I: Participant Information Sheet



Participant Information Sheet

The impact of psychological flexibility and self-evaluative beliefs on distress due to auditory hallucinations

What is the purpose of the study?

We know that the experience of hearing voices can affect people in lots of different ways. Some people view their voices as a positive aspect in their lives while others can find the experience upsetting. This study is about factors which may lead to distress due to hearing voices. These include the beliefs people have about the voices they experience and how they view themselves. We hope that by finding out more about the factors that can lead to distress, interventions to promote psychological well-being amongst voice hearers can be improved.

Why have I been invited to take part?

You are being asked to take part because you have reported hearing voices and are currently accessing NHS mental health services.

Do I have to take part?

No, your participation is entirely voluntary. Whether you decide to take part in the study or not will not affect any aspect of your care. If you change your mind and no longer wish to participate in the study, you can withdraw at any time and don't have to give a reason. You also have the right to ask that any information collected up to that point be withdrawn from the study and destroyed.

What will happen to me if I take part?

I will provide you with a Consent Form to read and will answer any questions you may have. If you are happy to participate, I will ask you to sign the Consent Form. You will also be given a copy of the Consent Form to keep. The information you give during our appointment will be stored in a dataset on an NHS computer while further data is collected from other participants. If you become unwell at any point after our appointment, the information you gave me will be still be used.

What will I have to do?

If you choose to take part in this research, we will meet at a day, time and location that is most suitable and convenient for you. This may be at an NHS location or at your home. At this meeting, we will talk more about the study and I will answer any questions you may have. You will be asked questions about your experience of hearing voices and complete questionnaires about your view of yourself and your attitudes towards hearing voices. This will take approx. 45 minutes to complete and you will be offered breaks throughout.

What are the possible disadvantages and risks of taking part?

The measures used in the present study have been used by many other researchers, without reports of harm. However, in the unlikely event that you become distressed by some of the questions about hearing voices, you will be given an opportunity to speak to someone from your mental health team.

What are the possible benefits of taking part?

There is unlikely to be any direct benefit to you although you may find it helpful to have an opportunity to discuss your experiences. In addition, you may feel that by taking part in this research you will contribute to a greater understanding of the factors that lead to distress due to hearing voices. We hope this will allow us to improve psychological interventions which aim to increase well-being amongst voice hearers.

Will my taking part in the study be kept confidential?

Your GP will be informed that you have participated in the study. Any information you provide during the study will be kept confidential. The only exception to this is if you tell me anything that makes me think you are at risk of harm or others around you are at risk. If this happens, I will have to tell my clinical supervisor and the duty worker in your Community Mental Health Team or a member of the nursing team if you are currently an inpatient. This is to make sure that you and other people are safe. If this were to happen, I would inform you of it first and discuss with you what to do next.

What will happen to the information from the study?

It is your decision if you would like to know what I find from the research. If you wish to know the results of the study, I can provide you with a written summary via your mental health team. I will also write the study up and submit it to the University of Edinburgh as part of my doctoral course in Clinical Psychology. I intend to publish the study in a peer-reviewed journal so that it can help other clinicians in their decision making when working with voice hearers.

Who has reviewed the study?

The East of Scotland Research Ethics Committee REC 2, which has responsibility for securitising all proposals for medical research on humans in Tayside, has examined the proposal and has raised no objections for the point of view of medical ethics. It is a requirement that your records in this research, together with any relevant records, be made available for scrutiny by monitors from the University of Dundee and NHS Tayside, whose role is to check that research is properly conducted and the interests of those taking part are adequately protected.

Who is organising the research and why?

This research is being conducted by Lauren Quigley as part of the Doctoral programme in Clinical Psychology at the University of Edinburgh. If you have any further questions about the study, please contact Dr Claire Campbell on: 01382 346055 or email: clairecampbell@nhs.net. If you would like to discuss this study with someone independent of the study team, please contact Dr Penelope Noel on: (01382) 346562 or email: penelope.noel@nhs.net

Who should I contact if I want to make a complaint?

If you believe that you have been harmed in any way by taking part in this study, you have the right to pursue a complaint and seek any resulting compensation through the University of Edinburgh who are acting as the research sponsor. Details about this are available from the research team. Also, as a patient of the NHS, you have the right to pursue a complaint through the usual NHS process. To do so, you can submit a written complaint to the Complaints and Feedback Team Lead, Complaints and Advice Team, Level 9, Ninewells Hospital, Dundee, DD1 9SY. (Free phone: 0800 027 5507). Note that the NHS has no legal liability for non-negligent harm. However, if you are harmed and this is due to someone's negligence, you may have grounds for legal action against NHS Tayside but you may have to pay your legal costs.

Thank you for taking the time to read this information sheet and considering whether you would like to help my research.

Appendix J: Consent Form



Consent Form

The impact of psychological flexibility and self-evaluative beliefs on distress due to auditory hallucinations

Name of Researcher: Lauren Quigley

Please initial
all boxes

1. I have read and understand the Participant Information Sheet (Version 3, 9th August 2013) for the above study and have been given an opportunity to ask any questions. ☐
2. My participation in this study is entirely voluntary and should I decide not to take part this will not affect my care/treatment. ☐
3. I know that I can withdraw my consent at any time, without reason and that this will not affect my care and/or treatment. ☐
4. I know that whilst this information is confidential, if I do say anything that would indicate a risk of harm to myself and/or others, this information will be discussed with relevant professionals including my clinical supervisor and a member of your Community Mental Health Team or ward nursing staff. ☐
5. I know that information I give during participation may be accessed by all members of the research team. ☐
6. I understand that relevant sections of my medical notes and data collected during the study may be looked at by individuals from the sponsor (the University of Edinburgh), regulatory authorities or the NHS Board, where it is relevant to my taking part in this research. I give permission to those individuals to have access to my records. ☐
7. I agree to my GP being informed of my participation in the study. ☐

8. I agree to take part in the above study.

☐

_____ Name of Participant	_____ Date	_____ Signature
_____ Name of Person taking consent	_____ Date	_____ Signature

Original plus two copies required.

Original to be retained in site file. One copy to be included in hospital notes. One copy to be retained by the participant.